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UNIVERSITY OF DURHAM

مركز دراسات الشرق الأوسط
والدراسات الإسلامية

CENTRE FOR MIDDLE EASTERN
AND ISLAMIC STUDIES

Manpower and Migration:
the effects of
international labour migration
on agricultural development
in the East Jordan Valley
1973 - 1980

by

Ian J. Seccombe

935.6

COMBE

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PREFACE

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It is increasingly suggested by labour market analysts that the labour-supplying states have gained little from participation in the international labour market. Böhning¹ concludes that 'the value added by migrant labour is largely internalised in the migrant-receiving country'. Similarly, Birks and Sinclair² argue that the disruption of domestic development consequent upon participation in a volatile regional labour market has 'compromised what little development these countries would otherwise have been capable of'.

The characteristics, volume and direction of labour flows in the Arab region have been dealt with comprehensively by various analysts.³ The following review seeks to examine the implications of such movements for social and economic development in one labour-supplying state, namely the Hashemite Kingdom of Jordan. Adopting a project-specific approach, the discussion proceeds to examine the patterns and processes of labour movements in the East Jordan Valley and the implications of such movements for the progress and direction of development of the East Jordan Valley Project. The author is seeking to draw attention to the close inter-relationship between what have previously been considered discrete elements of migration study (Mabogunje)⁴, namely emigration and immigration. White (following Pitié)⁵ states that 'even in areas of profound migration loss, account must be taken of flows of incoming population which may either ... help to reduce the general effects of net loss or ... serve to exacerbate and amplify certain of those effects'.

This analysis relies essentially on the observations distilled and material gathered during a short period of fieldwork conducted in the East Jordan Valley at the offices of the Ministry of Labour and of the Jordan Valley Authority during March/April 1980.

Part I, which follows this Preface, focuses attention on Jordan's role as a supplier of labour to the capital-rich states and the impact of this role on the potential and characteristics of domestic development. This introduction serves merely to establish a broad national framework within which developments in the East Jordan Valley are subsequently discussed.⁶

NOTES

1. Böhning, 1978, 14
2. Birks and Sinclair, 1980a, 342
3. See, for example, Birks and Sinclair, 1980b; Ecevit, 1979; Pennisi, 1980
4. Mabogunje, 1970
5. Pitié, 1971
6. A comprehensive discussion of the macro-economic impact of Jordanian labour migration is contained in Seccombe, 1980

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PART ONE: JORDANIAN LABOUR MIGRATION AND ECONOMIC DEVELOPMENT

1.1. Introduction

Economic development in Jordan has been frustrated by limited natural resources and the economy's vulnerability to external influences. The initial handicap of poor resources has been aggravated by the continuing uncertainties of regional politics together with rapid population growth, widening disparities between rural and urban income/employment opportunities, fluctuating national income from variable agricultural production, continued dependence on world phosphate prices and a high rate of domestic inflation. There is the additional contradiction of a free enterprise philosophy dependent on substantial foreign exchange support. Mazur¹ suggests that 'despite a fundamentally free enterprise philosophy of economic policy, postwar Jordan had arrived at an economy in which Government expenditure predominated to an extraordinary degree'.

The emergence and rapid expansion in labour demand by the major oil-rich states (from 1973) seemed to offer Jordan (and other potential labour-supplying states within the region) the panacea for two major development constraints, namely a high level of under- and un-employment, and a severe shortage of capital development funds.

In retrospect, however, it is now clear that the seeming palliative of international labour migration has had detrimental consequences for short, medium and long term domestic development. The financial benefits of remittance inflow and the reduction in unemployment has been negated by the social, economic and political costs of dependent development, accelerated inflation, deteriorating industrial relations and a gross distortion of the factor price structure.

Before turning to the relationship between migration and economic development in Jordan, an attempt will be made to establish the magnitude of the Jordanian migrant community.

1.2. The Scale of Labour Migration

Hitherto the lack of statistical data relating to basic demographic variables has resulted in considerable uncertainty concerning the number of Jordanian migrant workers. The lack of consensus on such

basic variables as population size, labour force size, sectoral distribution of employment, unemployment levels, wage rates and emigration patterns, make labour market analysis particularly superficial. This uncertainty is compounded by the failure of the available statistics to distinguish between Jordanian and Palestinian populations.) The assumption that all West Bank Palestinians abroad had emigrated from the East Bank would seriously over-estimate the levels of outmigration and future return movements. Furthermore, it also inflates the volume of remittances received by Jordan if we assume that all remittances passing through the Jordanian banks remain in the East Bank.

This failure to distinguish between Jordanian and Palestinian migrants remains a considerable constraint. However, the announcement of preliminary results from the 1979 National Census of Population² provides a basis from which a crude estimate of the number of migrant workers from the East Bank may be deduced.

Assuming there were some 210,000 Jordanians working abroad in 1975 (Sinclair) what level had been attained by 1979/1980? The majority of estimates, ranging from 70,000 to 400,000, imply that the outflow continued in the second half of the decade. It is seldom clear, however, to whom these figures actually refer - whether to Jordanians or to Jordanians and Palestinians. Furthermore, few sources state explicitly that they are referring to those 'working abroad'. (Table 1). The work of the International Migration Project in estimating such populations was based on an exhaustive examination of data from the labour-importing states. While this is the most comprehensive analysis currently available, it inevitably made a number of heroic assumptions. The estimate which follows is based on new data from the labour-supplying state and, using a 'residual approach', seeks to establish the net loss of labour from the Jordanian labour market.

The East Bank population of Jordan has been estimated in 1975 at 1,953,000.³ Given an annual population growth rate of 3.5 per cent and nil net migration, this would have grown to 2,291,250 by 1979. The latter is considerably higher than the actual census figure for 1979 of 2,152,000. Furthermore, account must be taken of the non-Jordanian populations included in the 1979 census total. Ministry of Labour sources⁴ suggest the number of foreign workers in Jordan to be 70,000 (1979); this excludes the Syrian worker population which is currently

TABLE 1 : ESTIMATED NUMBER OF JORDANIANS AND PALESTINIANS
WORKING ABROAD : VARIOUS AUTHORS

| | Year | Estimate | Author and Notes |
|--|---------|----------|--|
| | 1. 1974 | 200,000 | Azar, 1974, 14, refers to 250,000 Jordanians working abroad of whom 80 per cent are in the Middle East. |
| | 2. 1975 | 100,000 | Salt and Keeley, 1976, base their estimate on the 'difference between actual and projected population age distribution', comparing the 1974 and 1975 Multipurpose Household Surveys with a United Nations estimate of population. The difference of 7 per cent, the authors suggest, represents 100,000 Jordanian migrant workers. This is a particularly convoluted analysis and the authors do not press their claim. |
| | 3. 1975 | 150,000 | The International Migration Project derived an estimate for the number of Jordanians abroad from Anani (below 8), assuming similarity between the 1975 and 1977 figures. (For the main reasons for this assumption see Birks and Sinclair, 1980a) |
| | 4. 1975 | 264,717 | This figure refers to Jordanians and Palestinians and was derived from country of employment data. See Birks and Sinclair, 1978b, 13, Table 4. This total is divided in the following proportions: 57 per cent Jordanian and 43 per cent Palestinian, based on the official estimate. |
| | 5. 1975 | 250,900 | Ecevit, 1979, 5, Table 2 refers to both Jordanian and Palestinian East Bank migrants. |
| | 6. 1976 | 100,000 | Mazur, 1979, 119, No basis for this estimate is provided. |
| | 7. 1976 | 300,000 | As Minister of Labour, Ajlouni stated in 1976 '... there are now 300,000 Jordanian citizens working abroad'. See MEED, October 1 1976. Presumably this refers to both Palestinians and Jordanians. Ajlouni referred to 69,000 migrant 'Jordanian citizens' in Kuwait. This conflicts with the 1975 Kuwaiti census data which enumerated 47,102 (comprising 38,935 active Jordanians and 8,167 active Palestinians) and suggests that Ajlouni has over-estimated. See Birks and Sinclair, 1980b |
| | 8. 1977 | 150,000 | Again an 'official' Ministry of Labour estimate, from the Under Secretary for Labour, J. Anani, who refers to 'Jordanians' working abroad. See MEED, June 3 1977. |

(contd)

Table 1 contd.

| | | | |
|-----|-------------|-------------|---|
| 9. | 1977 | 150-300,000 | Clarke, 1977. This estimate is clearly derived from the two previously cited sources. |
| 10. | 1978 | 120-150,000 | Dajani and Murdock, 1978. No details. |
| 11. | 1978 | 300,000 | Saket, 1978 refers to 'official' estimates. |
| 12. | 1978 | 300-400,000 | Arab Economist X, 198, 19. No basis for this estimate is given. |
| 13. | 1979 | 250,000 | McClelland, 1979, assumes that 50,000 of the official estimate of 300,000 migrant labourers came from the West Bank and so should be excluded. |
| 14. | 1979 | 400,000 | Carr in International Herald Tribune 1979. No basis for this estimate is given. |
| 15. | 1979 | 200,000 | UNFPA, 1979, 21. Reports continuous out-flow of labour since 1973. |
| 16. | 1979 | 350,000 | Ajlouni's estimate is for 'Jordanians' in the Gulf States. See MEED, 1980b. |
| 17. | 1979 | 150-200,000 | Muhd. Abdel-Hadi, Dept. of Research, Ministry of Labour, Amman. Personal conversation, March 30 1980. |
| 18. | 1979 | 250-300,000 | Abu-Nuwar, Census Research Department, Dept. of Statistics, Amman. Personal conversation, March 26 1980. |
| 19. | Early 1970s | 100,000 | Tables III-7 to III-9 in Pennisi, 1980. Includes 'Jordanians from the West Bank and Palestinians who register themselves as Jordanians with labour importing countries', it also includes estimates (not stated) for clandestine migration. |
| | Mid 1970s | 200,000 | |
| | Late 1970s | 350,000 | |
| 20. | 1980 | 300,000 | Financial Times Survey, June 18 1980. Refers to 'various estimates'. |
| 21. | 1980 | 70,000 | Figure quoted by Crown Prince Hassan in Middle East Economic Digest (1980), 3. |
| 22. | Mid 1970s | 210,000 | Sinclair, C.A. Personal conversation, July 1980, suggests that the IMP's earlier estimate (4) may have been 50,000 too high. This over-estimate was the result of discrepancies in the data for Saudi Arabia. |
| 23. | 1980 | 400,000 | In MEED 1980d, This estimate refers to 'Jordanians working abroad' and is for August 1980. It is suggested that this represents a 51% increase over August 1979 when the Ministry estimates that 265,000 Jordanians were employed abroad. Compare this with references 17 and 21, again both from 'official' sources. |

(contd)

Table 1 contd.

| | | | |
|-----|-----------|---------|--|
| 24. | 1980 | 101,000 | Kirman, 1980. Kirman's analysis is based on the 1979 Census but he assumes: (i) a population growth rate 1975-1979 of 3.9% (ii) a crude participation rate for replacement migrants of 45% (iii) a crude participation rate for Jordanian migrants of 42% |
| 25. | 1979/1980 | 122,000 | Present author's estimate, see section 1.2. |
| 26. | 1980 | 250,350 | Birks and Sinclair, 1980c, a further re-assessment on the basis of labour-importing country data. |

Note that references 24 and 25 refer to the net loss of labour and do not provide estimates of the total numbers of Jordanians (and Palestinians) working abroad in 1979/80. They are therefore not strictly incomparable with the previous estimates.

estimated at 30,000.⁵ Adjusting the figure for foreign workers to represent total expatriate population in Jordan presents a further problem. Kirman⁶ suggests a crude participation rate of 45 per cent based on participation rate data for Egyptian and Syrian migrant labour from the 1975 Kuwait Census.⁷ However, these figures are not strictly comparable with the characteristics of in-migration to Jordan.

Data derived from the 1978 Jordan Valley Pre-Census Test⁸ record a non-Jordanian employed population of 1,788 in a total non-Jordanian population of 2,264. This implies a crude participation rate of 79 per cent. The fact that the majority of non-Jordanians in the Jordan Valley are employed in the agricultural sector is not regarded as misleading since over 60 per cent of work permits issued in 1980 have been for foreign workers in agriculture.⁹ In any case, participation rates for migrants in the secondary labour market are unlikely to have significant sectoral variance.¹⁰

A crude participation rate of 79 per cent implies a total non-Jordanian population of 85,600. The estimated 30,000 Syrians must be added to this figure. Assuming a Syrian participation rate of 40.4 per cent,¹¹ (total Syrian population in Jordan may be 74,000.) Thus the total non-Jordanian population in 1979 is estimated at 162,600 and therefore the 1979 population of Jordanians alone is 1,989,400. This latter figure can be compared with the 1979 figure of 2,291,250 assuming 3.5 per cent annual natural increase and nil net migration, suggesting a net emigration of 301,850 from Jordan during 1975 to 1979.

The crude participation rate for Jordanians abroad has been estimated at 40.4 per cent.¹² On the basis of this figure one can conclude that there has been a net emigration of 122,000 Jordanian workers over the period 1975-79. Note that this 'residual approach' does not indicate gross annual flows nor does it provide an estimate of the total number of 'Jordanians' working abroad in 1979/1980. However, Birks and Sinclair¹³ suggest (on the basis of country of employment data) that in 1980 there were some 250,350 Jordanians and Palestinians working abroad.

The significance of the estimate presented above is emphasised by comparing it with the estimated number of new entrants to the Jordanian labour force of 147,414 over the period 1975 to 1980.¹⁴ This implies that net outflows of Jordanian manpower were equal to

TABLE 2 : NATIONAL PLANNING COUNCIL: PROJECTED LABOUR SUPPLY
AND DEMAND BY OCCUPATIONAL CATEGORIES 1976-1980

| Occupational Category | Total Supply | Expected Net Outflow | Residual | % Supply in Outflow | Additional Demand(a) |
|--|--------------|----------------------|----------|---------------------|----------------------|
| A1 - Professional occupations ordinarily requiring a science-based degree. | 5,500 | 2,440 | 3,060 | 44.4 | 1,780 |
| A2 - Professional occupations ordinarily requiring an Arts-based degree | 21,296 | 9,811 | 11,485 | 46.1 | 3,426 |
| B - Technical and sub-professional occupations ordinarily requiring two years post-secondary education | 22,956 | 12,767 | 10,189 | 55.6 | 11,325 |
| C1 - Skilled office occupations ordinarily requiring basic secondary education | 45,518 | 7,393 | 38,125 | 16.2 | 17,251 |
| C2 - Skilled manual occupations ordinarily requiring basic secondary education | 9,390 | 4,243 | 5,147 | 45.2 | 23,969 |
| D - Other occupations | 42,754 | 7,590 | 35,164 | 17.7 | 24,694 |
| TOTAL | 147,414 | 44,244 | 103,170 | 100.0 | 86,648 |

Source: National Planning Council, 1976a, 8, Table 1, Amman, May 1976

Note: (a) Additional demand refers to non-farm employment only.
Total demand is 109,267

some 83 per cent of the anticipated growth in labour supply.

1.3. Labour and Skill Shortages

The 1976-1980 Five Year Plan¹⁵ assumed a 4.4 per cent annual increase in labour demand, a figure which Mazur considers to be conservative and, given his readjustment of sectoral employment, this is increased to 8.1 per cent. Given a small pool of unemployed labour on which to draw and with numbers joining the labour market increasing at only 3 per cent per annum, the labour force could only grow at the necessary rate by assuming a massive increase in productivity per worker and an increase in women's labour force participation rate. The 1976 Multi-Purpose Household Survey¹⁶ shows labour force participation rates of 34.9 per cent (male) and 3.8 per cent (female) and it is unlikely that the latter could be increased to the extent necessary. A projected 32 per cent increase in the labour force over five years (375,000-495,000) represents an average annual increase of 24,000, that is a growth rate of 6.4 per cent per annum. The projected increase in overall participation rate from 19.6 per cent (1975) to 22 per cent (1980) is inconsistent with contemporary trends. Salt and Keeley¹⁷ have shown that labour force participation rates have been falling as the labour force grew less rapidly than population. It is within this context of a tight labour market structure that the development of specific skill shortages and replacement has occurred.

The Five Year Plan 1976-1980 recognised that 'the emigration of professional and skilled workers has assumed new dimensions at a time when Jordan's own need for technical and skilled personnel has intensified owing to the growing requirements of the various economic sectors ...'¹⁸ A study for the National Planning Council (1976)¹⁹ indicates a shortfall in supply over demand of some 6,000 workers. However, this aggregate figure conceals the disproportionate loss of skilled labour which, for the categories B and C2 (sub-professional and skilled manual workers), reaches 55.6 per cent and 45.2 per cent respectively of the available supply (Table 2). In the case of skilled manual workers, demand was increasing at 27.7 per cent. This analysis can, however, be regarded as highly optimistic and is based on a number of seemingly implausible assumptions. The NPC assumed a conservative

estimate in the demand for labour by applying unrealistically high productivity increases per worker, e.g. 7 per cent per annum in manufacturing. These estimates were based on the expected capital/labour ratios in the Five Year Plan (Table 3). Secondly the NPC assumed that non-Jordanian institutions would supply 22,129 entrants to the workforce during the 1976-1980 period at the highest occupational levels (A and B).²⁰ However, there is no accurate way of estimating what proportion of Jordanians studying abroad will return to work in Jordan and to assume that all such graduates will do so is clearly over-optimistic. Supply from Jordanian institutions should be relatively accurate but what is the basis for the NPC's assumed 30 per cent net outflow and why is that for categories C and D only 10 per cent?

This very convenient analysis thus reduces the unadjusted employment demand of 140,185 to a net shortage of 6,000. The NPC report concludes "... Jordan might achieve some labour surpluses at the end of the Plan as a result of its social policy. The introduction of a social security scheme and the subsidised housing projects might curtail the expected outflow of Jordanians and consequently increase the labour supply".²¹

An alternative projection by Salt and Keeley implies a severe shortage of labour; in particular they predict a major increase in demand for professional (A2) and skilled manual workers (C2) given the planned expansion in services, finance and manufacturing sectors. Overall, Salt and Keeley predict a much larger growth in manpower requirements (185,000) than does the National Planning Council (109,267). In particular, this relates to differing estimates of the increased requirements in public administration, where Salt and Keeley's projected growth of 62,741 is a 100 per cent increase on Chawi's predicted 31,400 (Table 4). Salt and Keeley accept the Five Year Plan's estimate of increased labour supply at under 120,000, thus implying a severe labour shortage when compared with their demand projection of 185,000 (Table 5). Moreover, Salt and Keeley recognise that their demand projections may be optimistically low since they also assume the NPC's estimated increase in output per worker. Comparing the USAID demand projection with the NPC estimate of net supply, one obtains a slightly more realistic picture of net shortages (Table 6); even so the author would regard this as a highly crude and conservative estimate. In the

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TABLE 3 : JORDAN: ANNUAL LABOUR PRODUCTIVITY RATIOS

| | |
|---|------|
| Agriculture | 3.5% |
| Mining and Quarrying | 7.0% |
| Manufacturing | 7.0% |
| Electricity, Water and Gas | 6.0% |
| Construction | 3.0% |
| Trade, Restaurants, Hotels | 1.0% |
| Transport and Communications | 3.0% |
| Finance, Real Estate, Business | 1.0% |
| Public Administration and Personnel Service | - |

Source: National Planning Council, 1976a, 11.

TABLE 4 : NET CHANGES IN EMPLOYMENT, 1975-1980, ALTERNATIVE ESTIMATES

| Employment Sector | Salt and Keeley | | NPC | |
|----------------------------|-------------------------|-------|-------------------------|-------|
| | Employment 1975-1980 | % | Employment 1976-1980 | % |
| Agriculture | 17,763 | 9.5 | 22,619 | 20.7 |
| Mining and Manufacturing | 52,857 | 28.6 | 27,956 | 25.6 |
| Construction | 3,240 | 1.8 | 2,937 | 2.7 |
| Electricity, Gas and Water | 2,615 | 1.4 | 1,461 | 1.3 |
| Transportation | 15,461 | 8.4 | 6,672 | 6.1 |
| Trade | 21,564 | 11.7 | 12,628 | 11.6 |
| Financial Institutions | 6,723 | 3.6 | 3,594 | 3.3 |
| Public Administration | 62,741 | 33.9 | 31,400 | 28.7 |
| TOTAL | 184,964 | 100.0 | 109,267 | 100.0 |

Sources: Salt and Keeley, 1976, 43

National Planning Council, 1976b, 13.

TABLE 5 : JORDAN: PROJECTED CHANGES IN DISTRIBUTION OF EMPLOYMENT BY SECTOR 1975-1980

| Employment Sector | Employment in 1975 | | Employment in 1980 | |
|------------------------------------|--------------------|-------|--------------------|-------|
| | No. | % | No. | % |
| Agriculture | 79,050 | 20.1 | 97,551 | 17.1 |
| Mining and Manufacturing | 37,755 | 9.6 | 89,455 | 15.7 |
| Construction | 30,283 | 7.7 | 33,095 | 5.8 |
| Electricity, Gas and Water | 2,753 | 0.7 | 5,300 | 0.9 |
| Transportation | 30,676 | 7.8 | 45,549 | 8.0 |
| Trade (wholesale and retail) | 58,599 | 14.9 | 79,140 | 13.9 |
| Financial Institutions | 8,250 | 2.1 | 14,791 | 2.6 |
| Public Administration and Services | 145,908 | 37.1 | 205,986 | 36.1 |
| TOTAL | 393,283 | 100.0 | 570,867 | 100.0 |

Source: Salt and Keeley, 1976, 42.

| |
|-------|
| % |
| 20.7 |
| 25.6 |
| 2.7 |
| 1.3 |
| 6.1 |
| 11.6 |
| 3.3 |
| 28.7 |
| 100.0 |

first place, there is no reason to assume that productivity will increase, especially given the outmigration of the most skilled labour. Secondly, Salt and Keeley make some excessively conservative estimates for increased demand, particularly in the construction sector, where they assume an increase of only 3,240 over 1975-1980. This relates to their use of the 1975 Census of Industrial Establishments²² as the basis for calculation. The latter only enumerated establishments with five or more workers and therefore underestimated employment in sectors where a large proportion of employment occurs in small and informal unlicensed units. In particular, the survey has grossly under-estimated employment in the construction sector at 8,427 in 1975. This compares with the 1961 Census²³ figure of 22,000 in the East Bank construction sector. Mazur has readjusted the 1975 estimate to a minimum figure of 33,000 (a figure equal to that assumed by Salt and Keeley for 1980). Despite these drawbacks, the situation elaborated by Table 6 seems more realistic than previous projections, showing a massive shortfall in skilled manual labour of 54,000, and also reveals a shortfall in unskilled labour (D) where previous estimates have assumed a continuing surplus supply. (Table 4 compares the Salt and Keeley estimate of net change in employment with that of the NPC).

1.4. Aid, Remittances and GDP

Turning to the macro-economic impact of international labour migration, it can be demonstrated that, far from encouraging economic development, participation in a volatile regional labour market has compromised the development of which Jordan might otherwise have been capable.

Over the period 1973-1979, GDP (market prices) has grown from JD 268.5 million to JD 685.0 million (Table 7). However, this is not a reflection of growth in the productive base of the economy but rather it represents increased dependence on aid and remittances. Over the same period, budget support (particularly from the oil-rich Arab states) has grown from 22.7 per cent of GDP (JD 61 million) to 46.0 per cent (JD 314 million). Concomitantly, net remittances have expanded from 5.5 per cent of GDP (JD 14.7 million) to 22.8 per cent (JD 156.4 million). In combination, aid and remittances comprise a

TABLE 3.1 JORDAN: LABOUR DEMAND AND SUPPLY, 1975-1980

TABLE 4.1 JORDAN: LABOR DEMAND AND SUPPLY. COMBINED ESTIMATES, 1973-1980

| Occupational Category | Employment in 1973 | | Employment in 1980 | | Increased Demand 1975-1980 | NPC Estimate of Net Supply 1975-1980 | Residual |
|-----------------------|--------------------|-------|--------------------|-------|----------------------------|--------------------------------------|----------|
| | No. | % | No. | % | | | |
| A1 | 8,613 | 2.2 | 12,003 | 2.1 | 3,390 | 3,060 | - 330 |
| A2 | 31,172 | 7.9 | 46,385 | 8.1 | 15,213 | 11,485 | - 3,728 |
| B | 43,520 | 11.1 | 62,176 | 10.9 | 18,656 | 10,189 | - 8,467 |
| C1 | 71,632 | 18.2 | 100,911 | 17.7 | 29,279 | 38,125 | + 8,846 |
| C2 | 93,319 | 23.7 | 152,598 | 26.7 | 59,279 | 5,147 | -54,132 |
| D | 145,026 | 36.9 | 196,794 | 34.5 | 51,768 | 35,164 | -16,604 |
| TOTAL | 393,283 | 100.0 | 570,867 | 100.0 | 177,584 | 103,170 | -74,414 |

Sources: derived from Salt and Keeley, 1976, 47, Table 8; National Planning Council, 1976a, 8, Table 1

TABLE 7 : JORDAN: AID, WORKERS' REMITTANCES, IMPORTS AND GDP (JD mill), 1972-1979

| | GDP Market Price | Imports | Aid | Aid as % of GDP | Aid as % of Imports | Remittances (Net) | Remittances as % of GDP | Remittances as % of Imports |
|------|------------------|---------|--------|-----------------|---------------------|-------------------|-------------------------|-----------------------------|
| 1972 | 249.16 | 95.3 | 65.96 | 26.5 | 69.2 | 7.41 | 3.0 | 7.8 |
| 1973 | 268.51 | 108.2 | 61.09 | 22.7 | 56.2 | 14.7 | 5.5 | 13.6 |
| 1974 | 341.96 | 156.5 | 84.43 | 24.7 | 53.9 | 24.13 | 7.0 | 15.4 |
| 1975 | 306.50 | 234.0 | 138.01 | 45.0 | 59.0 | 53.25 | 17.4 | 22.8 |
| 1976 | 401.70 | 339.5 | 122.75 | 30.5 | 36.2 | 129.51 | 32.3 | 38.2 |
| 1977 | 477.6 | 454.4 | 166.94 | 34.9 | 36.7 | 139.75 | 29.3 | 30.7 |
| 1978 | 569.1 | 458.8 | 102.63 | 18.0 | 22.4 | 139.38 | 24.5 | 30.4 |
| 1979 | 685.2 | 588.3 | 314.43 | 45.9 | 53.4 | 156.42 | 22.8 | 26.6 |

Source: derived from Central Bank of Jordan, 1977 and 1980b, various tables

TABLE 8a : JORDAN: EXTERNAL TRADE STATISTICS, 1973-1979 (000 JD)

| | Re-Exports | Domestic Exports | Total Exports | Total Imports | Commodity Trade Balance |
|------|------------|------------------|---------------|---------------|-------------------------|
| 1973 | 4.9 | 14.0 | 18.9 | 108.2 | - 89.3 |
| 1974 | 10.3 | 39.4 | 49.7 | 156.6 | -106.9 |
| 1975 | 8.8 | 40.1 | 48.9 | 234.0 | -185.1 |
| 1976 | 19.9 | 49.6 | 69.4 | 339.5 | -270.1 |
| 1977 | 21.8 | 60.3 | 82.1 | 454.5 | -373.4 |
| 1978 | 26.8 | 64.1 | 90.9 | 458.9 | -368.0 |
| 1979 | 38.3 | 82.9 | 120.9 | 588.2 | -467.3 |

Source: derived from Central Bank of Jordan, 1980b

TABLE 8b : JORDAN: INVISIBLE EARNINGS, 1973-1979 (000 JD)

| | Interest and Investment | Net Worker Remittances | Net Transfer Payments | Net Transfers from Arab Governments |
|------|-------------------------|------------------------|-----------------------|-------------------------------------|
| 1973 | 5.08 | 14.70 | 64.60 | 23.66 |
| 1974 | 6.70 | 24.13 | 86.74 | 46.6 |
| 1975 | 8.23 | 53.25 | 139.80 | 105.65 |
| 1976 | 8.25 | 129.61 | 126.55 | 77.59 |
| 1977 | 7.35 | 139.75 | 165.83 | 132.31 |
| 1978 | 8.54 | 139.38 | 106.51 | 66.26 |
| 1979 | 11.04 | 156.42 | 314.43 | 299.62 |

Source: derived from Central Bank of Jordan, 1980b

massive 68.8 per cent of GDP. The Jordanian economy is thus dependent on external funds over which it has limited control.

Whilst Jordan's balance of payments has traditionally exhibited a large deficit in the trade account, that imbalance has grown dramatically since 1973, from JD 89.3 million to JD 467.3 million in 1979 (Table 8a). This reflects a 443.6 per cent increase in the value of domestic imports compared to a growth in total exports of only 62 per cent. Although current consumer goods only represent 10.6 per cent of total imports, they are the fastest growing component of the import bill, increasing by 33.4 per cent over 1978-1979. By 1979, current and durable consumer goods represented 40 per cent of total imports at JD 550 million (Table 9). It can be suggested that, whilst remittances have covered an otherwise large trade deficit, it is these very remittances which have exaggerated the trade deficit by facilitating the imports boom. In 1976, remittances covered 38.2 per cent of the total import bill; the subsequent growth in remittances (from JD 129 million in 1973 to JD 156.4 million in 1979) has been outpaced by the imports boom. By 1979, remittances only covered some 26.6 per cent of the import bill. The deficit has been largely made up by a massive increase in aid following the Baghdad Arab Summit.²⁴

The stability of the Jordanian Dinar has been essential in maintaining high levels of (official) remittance transfer. Concomitant this has encouraged investment not in export-oriented activity but in the production of non-tradeable goods and services. Asfour and Smadi²⁵ show that the distribution of bank credit continues to be biased in favour of property and commerce rather than industry and agriculture. As Kirman concludes "... the inadequacy of domestic capital markets militated against the optimal employment of such remittances for purposes of capital accumulation in productive sectors..."²⁶

The massive growth in net remittances from JD 7.4 million in 1972 to JD 156.4 million in 1979 reflects important changes in the migration patterns (Table 8b). In the period 1972-1976, growth from JD 7.4 million to JD 129.6 million reflects primarily the increased number of Jordanians working abroad together with a significant change in their characteristics from skilled professionals with a low propensity to remit to a predominance of semi-skilled and unskilled labourers. The latter have been characterised as 'target migrants',

| | 1972 | % | 1973 | % | 1974 | % | 1975 | % | 1976 | % |
|------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| TOTAL IMPORTS | 95.3 | 100.0 | 108.2 | 100.0 | 156.5 | 100.0 | 234.0 | 100.0 | 339.5 | 100.0 |
| <u>Consumer Goods</u> | 46.3 | 48.5 | 50.6 | 46.8 | 69.3 | 44.4 | 90.5 | 38.7 | 133.3 | 39.3 |
| Foodstuffs | 27.6 | 29.0 | 30.8 | 28.5 | 42.3 | 27.0 | 49.3 | 21.1 | 81.5 | 24.0 |
| Current Consumer Goods | 12.8 | 13.4 | 13.4 | 12.3 | 18.0 | 11.5 | 26.8 | 11.4 | 28.8 | 8.5 |
| Durable Consumer Goods | 5.9 | 6.1 | 6.4 | 6.0 | 9.2 | 5.9 | 14.4 | 6.2 | 23.0 | 6.8 |
| <u>Raw Materials</u> | 18.7 | 19.6 | 22.2 | 20.5 | 30.0 | 19.2 | 57.2 | 24.4 | 90.0 | 26.5 |
| Oil and fuels | 4.6 | 4.8 | 4.2 | 3.9 | 5.2 | 3.3 | 24.8 | 10.6 | 37.1 | 10.9 |
| <u>Capital Goods</u> | 18.6 | 19.5 | 20.2 | 18.7 | 41.0 | 26.2 | 82.9 | 35.4 | 114.6 | 33.7 |
| (Miscellaneous) | 11.6 | 12.4 | 15.2 | 14.0 | 15.9 | 10.2 | 3.4 | 1.5 | 1.6 | 0.5 |

| | 1977 | % | 1978 | % | 1979 | % | % Increase 1975-1976 | % Increase 1978-1979 |
|------------------------|-------|-------|-------|-------|-------|-------|-------------------------|-------------------------|
| TOTAL IMPORTS | 454.4 | 100.0 | 458.8 | 100.0 | 589.5 | 100.0 | 45.1 | 28.5 |
| <u>Consumer Goods</u> | 147.2 | 32.4 | 175.7 | 38.3 | 215.2 | 36.5 | 47.3 | 22.5 |
| Foodstuffs | 72.2 | 15.9 | 85.6 | 18.7 | 100.6 | 17.1 | 65.3 | 17.5 |
| Current Consumer Goods | 42.5 | 9.3 | 47.0 | 10.2 | 62.7 | 10.6 | 7.4 | 33.4 |
| Durable Consumer Goods | 32.4 | 7.1 | 43.1 | 9.4 | 51.9 | 8.8 | 59.7 | 20.4 |
| <u>Raw Materials</u> | 122.2 | 26.9 | 117.2 | 25.5 | 179.5 | 30.4 | 57.3 | 53.2 |
| Oil and fuels | 43.0 | 9.5 | 46.8 | 10.2 | 74.0 | 12.5 | 37.8 | 58.1 |
| <u>Capital Goods</u> | 184.1 | 40.1 | 161.2 | 35.1 | 193.6 | 32.8 | 38.4 | 20.1 |
| (Miscellaneous) | 1.9 | 0.4 | 4.7 | 1.0 | 1.3 | 0.2 | -54.3 | -72.3 |

Source: Central Bank of Jordan, 1977 and 1980a; derived from Table 26.

unaccompanied males with a high propensity to remit. A final factor has been the growth in real wages to all occupational groups in the oil-rich states.

Net worker remittances accruing to Jordan show a significantly slower growth rate after 1976 which can be related to the growth in payments abroad made by secondary migrants in Jordan. The latter increased from JD 6.8 million in 1976 to JD 24 million in 1979 (Table 10). Despite this, and the suggested fall in the number of Jordanians employed abroad, net remittances continue on their upward trend reaching JD 156.42 million in 1979. This almost certainly reflects government action to increase remittances through 'official' channels rather than a significant growth in total remittances. This has been achieved through the maintenance of a high exchange rate and by providing facilities for holding money in foreign currency accounts. A significant measure to capture remittances has been the floating of government Development Bonds which can be held by non-residents.²⁷ Furthermore, the Central Bank has sought to ease currency controls through a doubling of the foreign currency holdings limit to JD 10,000 and by permitting nationals living abroad to deposit foreign currency in local banks for up to five years.²⁸ These recent measures have led to a 13 per cent increase in official remittances between 1978 and 1979 (at a time when the migrant population was declining) compared to the 1977-78 increase of 5 per cent.

Despite these measures and the growth in opportunities for more productive use of remittances, there has been a fall in the real level of remittances from JD 122.3 million 1975 to JD 115 million in 1979 (at 1975 prices).²⁹

1.5. Inflation

Between 1975 and 1979, GDP at market prices rose from JD 269.4 million to JD 541.9 million, an annual increase of 25.3 per cent, whilst GNP rose from JD 370.3 million to JD 802.9 million, an annual increase of 29.2 per cent. Deflating these money increases to give GDP/GNP increases in real terms shows a much less dramatic rate of increase. GDP grew at 7.2 per cent per annum from JD 269.4 million to JD 347.4 million whilst GNP increased at 9.7 per cent per annum, a per capita increase of 6.2 per cent. GNP and GDP (1975 prices) have

TABLE 10 : JORDAN: WORKERS' REMITTANCES, 1972-1979, CURRENT PRICES
(JD mill)

| | Credit | Deficit | Net |
|------|--------|---------|--------|
| 1972 | 7.41 | - | 7.41 |
| 1973 | 14.70 | - | 14.70 |
| 1974 | 24.13 | - | 24.13 |
| 1975 | 53.25 | - | 53.25 |
| 1976 | 136.41 | 6.80 | 129.61 |
| 1977 | 154.75 | 15.00 | 139.75 |
| 1978 | 159.38 | 20.00 | 139.38 |
| 1979 | 180.42 | 24.00 | 156.42 |

Source: derived from Central Bank of Jordan, 1977 and 1980b, Table 23 (8.2)

TABLE 11 : JORDAN: COST OF LIVING INDEX, 1975-1979

| | Index | | Inflation Rate |
|------|-------|---------|----------------|
| 1975 | 100.0 | | |
| 1976 | 111.5 | 1975-76 | 11.5% |
| 1977 | 127.7 | 1976-77 | 14.5% |
| 1978 | 130.0 | 1977-78 | 0.9% |
| 1979 | 156.0 | 1978-79 | 14.6% |

Source: derived from Central Bank of Jordan, 1980, various tables

TABLE 12 : JORDAN: ARRIVALS AND DEPARTURES, 1974-1979

| | Jordanian Arrivals | Jordanian Departures | Net Flow |
|------|--------------------|----------------------|-----------|
| 1974 | 547,929 | 583,409 | - 35,480 |
| 1975 | 615,551 | 655,061 | - 39,510 |
| 1976 | 633,008 | 715,805 | - 82,797 |
| 1977 | 666,570 | 770,791 | - 104,221 |
| 1978 | 615,000 | 584,600 | + 31,000 |
| 1979 | 741,700 | 639,500 | + 102,200 |

Source: derived from Department of Statistics, 1979b, Table 41; Central Bank of Jordan, 1980c, Table 24.

had a negative growth rate since 1978. Compound growth rates over the period 1975-1979 are 6.8 per cent for GDP and 8.6 per cent for GNP, which on a per capita basis represent 3.3 per cent and 5.1 per cent. The rate of GNP growth appears higher because of the inclusion of remittances and aid. Superficially this is a relatively healthy picture of annual growth but in reality it reflects the fragile nature of the Jordanian economy, based as it is on aid and remittances rather than any real growth in production, as the per capita growth rate indicates.

Some considerable confusion surrounds the domestic inflation rate and its current trend. Birks and Sinclair³⁰ calculated a rise in Jordan's inflation rate from 15.3 per cent (1975-1976) to 33.5 per cent (1976-1977). However, the Department of Statistics have subsequently abandoned the cost of living index on which this was based and have recalculated the rate of inflation. The new cost of living index shows 1976-1977 inflation to have been 14.3 per cent on the basis of new weightings and an updated base year. This, and the subsequent decline in 1978 to 7 per cent does not agree with the facts of soaring construction costs, domestic wage inflation and inflated food prices (Table 11). According to Mazur,³¹ annual inflation had already reached 30 per cent by 1974, the most rapid increases coming in food prices. It is unlikely that, only three years later, the rate had been halved, particularly when the boom in remittances had yet to occur. Also the ensuing period was to see the influx of capital from the Lebanon and the increased aid payments after the Rabat summit of October 1974.

It seems to the author that, despite the exemplary presentation of these statistics in the Central Bank of Jordan reports, the resulting rate and declining trend in inflation are almost certainly spurious. The Government's continuing concern over the inflation rate is seen in the establishment of 'parallel' markets for the sale of basic commodities at cost price. In 1979 the subsidy bill had reached JD 70 million and the Government clearly wishes to phase subsidies out before they become an established and growing part of the budget.

The rapid expansion of remittances and capital inflows from foreign aid have been combined with growing demand, in regional terms, for Jordanian products leading inevitably to inflation in the general price level. At the same time, the tight labour market has led to growing wage demands and cost-push inflation. Pennisi³² suggests that

replacement migrants are now demanding non-discriminatory remuneration. The achievement of wage parity would encourage further attempts by the trades union movement to maintain wage differentials, thus furthering cost-push inflation.

1.6. The Government Response

The Government continues to perceive the question of manpower planning in terms of reducing high levels of labour outflow and maximising the supply of labour to the domestic labour market. Ministry of Labour officials believe (1980) that the demand for Jordanian labour will continue for the next 15-20 years before a gradual down-turn is experienced.³³ However, as will be shown below, labour shortages and a high outflow may soon give way to a marked return migration and large-scale unemployment. This disparity between predicted trends and official perceptions is likely to mean that the proposed ameliorative actions are inappropriate to changing labour market conditions.

In 1978, legislation was introduced to reduce the scale of labour migration and in particular to ameliorate the loss of skilled labour. The regulations attempted to introduce a selection process, granting permission to migrate only in cases where the applicant was unable to find 'appropriate' employment in Jordan. This proved inadequate and has subsequently been abandoned.³⁴ The resumption of an 'open door' policy has been accompanied by a new strategy seeking bilateral agreements for the exchange of labour with the labour-importing nations. The aim of such agreements is not to prevent emigration but to regulate the scale of outflow. At present, no successful accords have been negotiated and bilateral agreements such as those introduced for teachers (1979) are unlikely to be extended to other occupational groups.³⁵

Short-run measures to reduce outmigration through direct and indirect inducements have been of indeterminate value. Clarke's suggestion (1977) that 'Private and public sector employers need to look at the possibility of matching wage and salary levels paid to Jordanians working abroad', is a fallacious argument.³⁶ Wage increases of the scale necessary (200-300 per cent) would have a severe inflationary effect; having no basis in productive growth the results would be a decline of real wage levels. However, the Government could take action over wages to reduce public/private sector differentials which are currently

encouraging a migration of qualified and experienced personnel out of the public sector.³⁷ In January 1979, a 20 per cent pay rise for all Government employees was announced.³⁸ Further growth in public sector wages is, however, constrained by public finance considerations. The National Planning Council assumed that more indirect inducements would encourage potential migrants to remain in Jordan. By themselves, however, subsidised housing schemes and improved health and education facilities have little effect on the migrant motivation to depart. At present the Government is seeking to create a more equitable and stable labour relations atmosphere by encouraging the Trades Union Movement, introducing and extending the Social Security Law (January 1980) and redrafting the Labour Law.

Recognising the moratorium on the outflow of labour to be inappropriate and largely ineffective, the official Jordanian response must aim primarily to maximise the benefits of labour migration by designing a financial system conducive to the productive investment of remittances. Secondly, efforts must be directed towards improving the efficiency of the domestic labour market structure in order to reduce the negative effects of outmigration and the need for replacement migration.

Current aims focus on increasing the supply of labour to the domestic labour market via increased female participation and extension of the Vocational Training Programme. Recent data suggest that female participation in the labour force has increased from 3.8 per cent (1974) to an estimated 12 per cent (1980). Such a massive increase in female participation rates seems highly improbable and it is likely that the earlier figure underestimates the situation in 1974. In 1975, the Government established a Women's Department within the Ministry of Labour to facilitate the entry of women into the labour market. However, the employment of women is concentrated in predictable sectors. During 1978, women's rate of participation in clerical jobs was 41-67 per cent and in the clothing industry 45-61 per cent. Comparable rates for private business, crafts, manual industries and electrical industry ranged from 0.1 to 0.8 per cent.³⁹ Despite the fact that some 45 per cent of the enrolled 'student' population of 647,590 in 1977/1978 were female, traditional values regarding the employment of women outside the established sectors are likely to remain for some considerable time.⁴⁰

The Five Year Development Plan aimed to double the enrolments in

vocational education and to implement a National Training Scheme to provide intensive, short-term vocational training and apprenticeships. However, wage differentials and job ranking still reinforce the trends in favour of a university education rather than technical training by rewarding middle-level skills relatively poorly. The number of enrolments in vocational training have increased from 6,441 in 1975/6 to 9,182 in 1978/9; however this still only represents 12 per cent of those who complete secondary education.

The National Planning Council now recognises the need to encourage major industrial and construction companies to establish on-the-job training schemes. To date, the output from the vocational training scheme has been insignificant in comparison with the loss of skilled labour. Vocational training has not included any safeguards to ensure that graduates work for a specified period in Jordan before becoming eligible for work abroad. Both these programmes are essentially long-term and, in the short and even medium term, the only realistic proposal to increase the size of the labour force is likely to be continued in-migration of non-Jordanians. In the meantime, the Government has yet to come to terms with the evidence of growing return migration. At present, this evidence is largely restricted to arrivals/departures data, which show a dramatic reversal of net flows since 1978 (Table 12). A net surplus of in-migrants (Jordanian) of 31,000 occurred in 1978 and grew to 102,200 in 1979. Given a conservative estimate of the crude participation rate for Jordanians abroad (all skill levels) of 60 per cent, the latter figure may represent a return of up to 61,000 migrant workers. As a corollary, the Ministry of Labour recently (March 1981)⁴² recognised that fewer Jordanians were seeking employment abroad. Preliminary data for 1980 seem to confirm this trend.

Recent data from Kuwait indicate a decline in the number of Jordanians and Palestinians obtaining labour and residence permits. Table 13(a) illustrates the growing dominance of the Kuwaiti labour market by Asian sources. The latter have increased their share of the market from 50.7 per cent in 1977 to 60.0 per cent in 1979. This reversal is most dramatic in the construction sector, where the issue of permits to Arabs has declined from 41 per cent in 1977 to 26.9 per cent in 1979, whilst Asians now hold 71.1 per cent. The decline in the Arab share of the labour market has not affected all suppliers equally. Table 13(b) indicates the declining share of the market occupied by

Jordanians and Palestinians in contrast to the growing number of Egyptians. This confirms the notion that Jordan has reached its capacity as a labour supplier (in 1979 only 22.5 per cent of labour permits were issued to Jordanians and Palestinians, compared to 35.4 per cent in 1975). The number of Jordanians and Palestinians employed in Kuwait is unlikely to rise, especially in the face of strong competition from Asian sources. In contrast, the continued increase in the number of Egyptians reflects the later start made by Egypt in the 'mass' labour-export market with the positive encouragements given to migrants from 1976/1977. Egyptians now dominate the Arab share of new permit issues, with 48 per cent in 1979 compared to 26.7 per cent (1975).

Whilst we only have data for one labour importing state, these do support our hypothesis that fewer Jordanians and Palestinians are seeking renewals and new work permits.

The Jordanian authorities must plan now for return migration by increasing the labour absorption capacity of the domestic economy rather than continuing with policies that favour capital-intensive development projects encouraged by a temporarily distorted factor price structure.

1.7. The Market Response : Secondary Labour Imports

The need to import labour was recognised as early as 1975. The Five Year Development Plan sought to regulate the growth of in-migration by requiring the Ministry of Labour to '... undertake the task of organising the importation of labourers for various purposes in accordance with labour agreements signed with the countries concerned...'⁴³ Despite this and subsequent recommendations, the import of secondary labour has proceeded in an uncontrolled manner.

Competition for the limited pool of available manpower has contributed to domestic wage inflation to the extent that wages being offered have become attractive to non-Jordanians. Subsequently this 'replacement labour migration' (directed to specific sectors) has given way to a more generalised labour import (secondary labour migration). The latter comprises predominantly unskilled labour attracted by wage levels that may be 40-50 per cent below those accepted by Jordanian nationals. Of the 70-75,000 non-Jordanians working in Jordan in 1980, the Ministry of Labour estimated that up to 55 per cent were in construction

TABLE 13a : KUWAIT : RESIDENCE PERMITS ISSUED FOR WORK IN THE PRIVATE SECTOR, BY NATIONALITY AND ECONOMIC ACTIVITY, 1977-1979

| | 1977 | | 1978 | | 1979 | |
|-------------------------------------|--------|-------|--------|-------|--------|-------|
| | No. | % | No. | % | No. | % |
| General and social services | 1,267 | 4.3 | 716 | 4.1 | 684 | 4.0 |
| Finance, insurance & real estate | 1,170 | 4.0 | 742 | 4.2 | 858 | 5.1 |
| Transport, storage & communications | 1,349 | 4.6 | 606 | 3.4 | 622 | 3.7 |
| Wholesale and retail trade | 6,894 | 23.3 | 4,327 | 24.5 | 4,816 | 28.4 |
| Construction | 14,296 | 48.4 | 8,331 | 47.2 | 7,198 | 42.5 |
| Manufacturing | 3,980 | 13.5 | 2,561 | 14.5 | 2,249 | 13.3 |
| Mining and quarrying | 158 | 0.5 | 106 | 0.6 | 55 | 0.3 |
| Agriculture and fishing | 435 | 1.5 | 277 | 1.6 | 452 | 2.7 |
| Total | 29,549 | 100.0 | 17,666 | 100.0 | 16,934 | 100.0 |

TABLE 13b : KUWAIT : LABOUR PERMITS ISSUED, BY NATIONALITY (ARABS), 1975-79

| | 1975 | | 1976 | | 1977 | | 1978 | | 1979 | |
|---------------------------|--------|-------|--------|-------|--------|-------|--------------------|-------|--------|-------|
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Jordanians & Palestinians | 5,533 | 35.4 | 5,042 | 29.8 | 4,674 | 27.9 | 4,742 ^a | 26.7 | 4,304 | 22.5 |
| Egyptians | 4,164 | 26.7 | 6,336 | 37.5 | 6,723 | 40.2 | 7,258 | 40.9 | 9,110 | 47.7 |
| Syrians | 1,762 | 11.3 | 1,475 | 8.7 | 1,559 | 9.3 | 1,692 | 9.5 | 1,659 | 8.6 |
| Gulf | 2,433 | 15.6 | 1,914 | 11.3 | 1,657 | 9.9 | 1,651 | 9.3 | 1,448 | 7.6 |
| Iraqis | 874 | 5.6 | 942 | 5.6 | 849 | 5.1 | 1,049 | 5.9 | 1,085 | 5.7 |
| Lebanese | 843 | 5.4 | 1,204 | 7.1 | 1,264 | 7.5 | 1,346 | 7.6 | 1,491 | 7.8 |
| Total | 15,609 | 100.0 | 16,913 | 100.0 | 16,726 | 100.0 | 17,738 | 100.0 | 19,097 | 100.0 |

Source : Central Statistical Office, 1980, 164 and 60, Tables 153 and 148

and a further 25 per cent in the agricultural sector.⁴⁴ This relatively elastic supply of secondary migrants and their apparent willingness to accept employment in 1981 at average 1973 wage levels has negated any tendency for a rapid rise in real wage rates.⁴⁵ Furthermore, the development of a market for secondary labour migrants (principally from Egypt) has important implications in terms of the factor price structure in general and for employment policy in particular, given the signals of growing return migration of Jordanian nationals.

Growth of in-migration has been dramatic. Work permit issues show a rapid increase from 803 in 1975 to 26,458 in 1979.⁴⁶ The Ministry of Labour readily admitted that the majority of in-migrants in 1980 were without permits and suggested a minimum population of non-Jordanians in employment at 70-75,000. Subsequent changes in residence and work permit regulations provide a relatively accurate estimate for the non-Jordanian working population in early 1981 of 103,501 of whom over 80 per cent (82,000) are Arab nationals.⁴⁷

The remainder of this paper will examine the growing dependence on replacement labour in the East Jordan Valley. It has been argued that if the presence of 'replacement' migrants is merely indicative of short term labour shortages then the in-migrants are playing a useful role in maintaining the development momentum (Sinclair).⁴⁸ However a detailed analysis of population, income and employment data from the 1978 East Jordan Valley Pre-Test Census leads to the conclusion that a 'secondary' labour market has developed in which non-Jordanians are being employed in preference to Jordanians because of mobility and price advantages. Active displacement of nationals from the rural sector clearly has serious long and short term implications for development.⁴⁹

NOTES

1. Mazur, 1979, 127
2. Department of Statistics, 1980b
3. The 1975 population estimate used here is given by Birks and Sinclair, 1980a and derives from Department of Statistics, 1976b, 1, Table 1
4. Muhd. Abdul-Hadi, Department of Research, Ministry of Labour, Amman. Personal conversation, March 1980. Financial Times, June 18 1980 suggests a figure of 75,000 foreign labourers by mid-1980

5. Muhd. Abdul-Hadi, Department of Research, Ministry of Labour, Amman. Personal conversation, March 1980. It is not clear, however, whether this figure refers to a total Syrian population in Jordan of 30,000 or a total Syrian working population of 30,000. Sales, 1978, 63, suggests that the Ministry of Labour (Jordan) estimate for 1975 of 20,000 Syrian 'replacement' migrants is a conservative estimate. However this figure does refer to the number of workers and not to total population
6. Kirman, 1980
7. Birks and Sinclair, 1980b, 149, Table 34 gives 1975 expatriate community populations of 60,534 (Egyptian) and 40,962 (Syrian). p.144 Table 24 shows employed expatriate populations of 37,464 (Egyptian) and 16,519 (Syrian). These figures imply crude labour force participation rates of 62 per cent for Egyptians and 40.3 per cent for Syrians.
8. Department of Statistics, 1978, (November) unpublished preliminary results provided by the Jordan Valley Authority, Amman, March 1980
9. MEED, 1980c
10. See Part 3 below
11. Sales, 1978, 62 suggests this figure, derived from Syrians in Kuwait, 1975. However, it can be argued that the rate is much higher because the proximity of Syria to Jordan and ease of movement between the two countries will reduce the number of families accompanying migrants since they can make frequent home visits. Alternatively, one can suggest that this ease of movement together with internal unrest in Syria may encourage more migrants to take their families with them
12. Birks and Sinclair, 1980b imply an overall crude participation rate for Jordanians of 23.3 per cent comprising rates of 40.4 per cent for men and 4.4 per cent for women. Given the particular characteristics of the Jordanian population in Kuwait, the figure of 40.4 per cent will be assumed as more applicable to other Jordanian expatriate populations. Kirman, 1980 suggests a similar rate (42 per cent) but gives no basis for this assumption.
13. Birks and Sinclair, 1981, Appendix A
14. National Planning Council, 1976b, 342, suggests that the labour force will grow by 175,000-200,000 during the plan period. See also National Planning Council, 1976a, 8, Table 1
15. National Planning Council, 1976b
16. Department of Statistics, 1976a
17. Salt and Keeley, 1976, 19-20 and Table 2. Page 20 shows a fall in labour force participation rate from 22.9 per cent in 1961 to 19.6 per cent in 1975. While female participation rates increased from 2.8 per cent to 3.8 per cent, over the same period male participation declined from 42.4 per cent to 34.9 per cent.
18. National Planning Council, 1976b, 341
19. National Planning Council, 1976a

20. National Planning Council, 1976a, 8, Table 1 presents expected supply as follows:

| <u>Jordanian Institutions</u> | | <u>Non-Jordanian Institutions</u> |
|-------------------------------|---------|-----------------------------------|
| A1 | 1,445 | 4,055 |
| A2 | 3,902 | 17,394 |
| B | 22,276 | 680 |
| C1 | 45,518 | - |
| C2 | 9,390 | - |
| D | 42,754 | - |
| TOTAL | 125,285 | 22,129 |

21. ibid, 15.
22. Department of Statistics, 1975. Preliminary results are in Salt and Keeley, 1976, Chapter II
23. Department of Statistics, 1964.
24. For details of the 'Baghdad package' see MEED 1979b; some \$1.25 billion were promised over ten years.
25. See Asfour and Smadi, 1979, 21; also Asfour and Smadi, 1978, 15, Table 6; Saket, Asfour, and Assaf, 1980
26. Kirman, 1980
27. Details of bond issues are given in the International Herald Tribune, Dec. 13, 1979. Eleven issues of premium Development Bonds amounting to JD 65 million are currently outstanding. Bond issues have the following features:
- (i) Bonds are issued in units of JD 5 and JD 10 and multiples. They are cashable at par on maturity
 - (ii) Tax-free interest is paid in two equal instalments at 7.5 - 8.25 per cent p.a.
 - (iii) Half-yearly and yearly draws are made for a tax-free prize of JD 2,500
 - (iv) Bonds may be purchased and held by non-residents
 - (v) Non-residents purchasing bonds in a convertible currency enjoy the option of cashing the value at or before maturity, the interest earned and prizes won either in Jordanian currency or in a convertible currency
 - (vi) All earnings accruing to bonds, including capital gains, are free from all taxes and fees
28. MEED, 1979d; thereby earning a higher interest rate
29. Kirman, 1980
30. Birks and Sinclair, 1978a, 16
31. Mazur, 1979, 132-8
32. Pennisi, 1980, Chapter VIII
33. Muhd. Abdel-Hadi, Department of Research, Ministry of Labour, Amman. Personal communication, March 1980.

34. MEED, 1980a The restrictions on outmigration were lifted on January 30 1980
35. MEED, 1979c, 33 reports the secondment of 500 teachers to several Arab countries for 1979/80, referring to Saudi Arabia, Oman, Kuwait and Qatar
36. Clarke, 1977, 5
37. National Planning Council, 1976b, 48
38. MEED, 1979a
39. Graham-Brown, 1980, 29. Abdel-Jaber attacks the import of '... redundant labour from Egypt ...'
40. Ministry of Education, 1978
41. National Planning Council, 1976b, 341-47
42. MEED, 1981b, 22. Muh'd Abdul-Hadi
43. National Planning Council, 1976a, 346
44. Muh'd Abdul-Hadi. Personal communication, March 1980.
45. See Seccombe, 1980, 71-82 for a fuller discussion. Note that a wage rate 40 per cent below Jordanian levels is still some 2-300 per cent above current wage rates in Egypt
46. Muh'd. Abdul-Hadi. Personal communication. March 1980
47. MEED. 1981a, 31; Public Security Directorate announcement
48. Sinclair, 1980 Unpublished manuscript
49. The nature, extent and implications of this secondary labour market development is the focus of continued research by the author in both Jordan and the Sudan (1980-83).

PART TWO: THE EAST JORDAN VALLEY : A REGIONAL CASE STUDY

2.1. The East Jordan Valley Project 1975-1982

Even before the loss of the West Bank in 1967, Jordanian agricultural policy had focused on the Jordan Valley as the area of maximum development potential (see the Barka and Harza Surveys, 1952-54).¹ The period 1958-66 saw the construction of a 70 km East Ghor Canal and the expansion of irrigation and drainage systems to 120,000 dunum (1 dunum = 0.1 ha)

These developments were abruptly terminated in 1967 with the Israeli occupation of the West Bank and the subsequent war of attrition, 1970-1971.² By 1970, all economic activity in the area had ceased and the Valley was entirely depopulated.

Reduction of tension in the Rift Valley after 1971 led to a gradual re-occupation. The extensive nature of the war damage (over 65 per cent of all buildings were destroyed), combined with the region's economic and strategic importance, encouraged the institution of a comprehensive plan for the 'Rehabilitation and Development' of the East Jordan Valley (1973-1975).³

The immediate chaos and turmoil in the area restricted progress for several years to planning and awarding contracts. Only in 1975, under the unified administration of the Jordan Valley Commission, with the publication of the new Jordan Valley Development Plan 1975-1982, did construction commence.⁴ The new plan called for extensive water gathering schemes together with the irrigation of some 420,000 dunum (compared with a total cultivated area of 174,979 dunum in 1973). Land reforms, the regulation of cropping patterns and cropping intensity were to increase the value of output by 300 per cent (in constant prices 1975-1982). There seems little doubt that, if accurate, such returns would justify the high levels of capital investment being made. As Mazur points out, "the potential payoff to irrigation projects in the Jordan Valley is greater and more certain than to most investments in dryland agriculture or livestock production."⁵

While the plan recognised the need for a substantially larger and better trained labour force, the full implications of Jordan's role as a labour supplier and the interdependence of regional (East Jordan Valley), national and international labour markets had not been realised.

Previous discussion has shown how the development of the East Jordan Valley's economic potential is occurring within the structural context of a 'tight' labour market and specific skill shortages. It can be suggested that the manpower requirements for full development of the Jordan Valley's agricultural sector along the lines of the 1975-1982 Plan will be determined by five primary factors:

- (i) the area of irrigated land,
- (ii) the manner in which the irrigated land is divided into farming units,
- (iii) cropping intensity,
- (iv) cropping patterns, and
- (v) the nature of the farming technology adopted.

The following sections present an outline of agro-economic development in the East Jordan Valley since 1973 with emphasis on changes in each of these major variables and their implications for manpower requirements.

2.2. The Expansion of Irrigated Agriculture

In 1954, the total land area of the East Jordan Valley was surveyed at 605,840 dunum of which 364,080 dunum were classified as arable land. By 1979, some 234,394 dunum were cultivated, representing an increase of 59,415 dunum (34 per cent) over the 1973 total cultivated area of 174,979 dunum.⁶ The latter consisted of 158,911 dunum irrigated from various sources (East Ghor Canal 114,609 dunum; side wadis and springs 28,373 dunum; under-ground water 14,420 dunum and Jordan River water 1,509 dunum), together with 16,068 dunum rainfed. Variations in water availability meant that large areas were inadequately irrigated; thus the productive area irrigated by the East Ghor Canal was only some 114,609 dunum compared with the total irrigated area of 124,200 dunum.

The Jordan Valley Development Plan originally predicted a total irrigated area of 420,000 dunum, given the introduction of sprinkler irrigation throughout the East Jordan Valley. The latter was considered to be the most cost-effective irrigation technique, given its efficiency in water conveyance (94 per cent) and field application (85 per cent)⁷, together with the need to avoid grading of the shallow Jordan Valley soils. The present plan (1975-1982), however, provides for the irrigation of a preliminary area of only 360,000 dunum by 1983. This was

to be achieved through a series of water storage and distribution projects (Fig. 1)

- (i) Kafrein-Hisban project
- (ii) Zarqa river project
- (iii) East Ghor Canal 18-km extension
- (iv) Zarqa triangle project
- (v) Wadi Arabs complex

These projects were collectively referred to as the Jordan Valley Irrigation Project, Stage I, with an initial completion date of 1977 and a target irrigated area of 210,030 dunum. Completion of Stage I projects came early in 1979, but large areas of the new land could not be brought under irrigation because continued water shortages led to reduced allocations. This also meant a delay in the introduction of sprinkler equipment. The heavy rains of 1979-1980 should enable a full utilization of available water supplies and the progressive introduction of sprinklers.

To develop the additional irrigable area of 149,700 dunum will require the development of further storage facilities on the Yarmouk river. Stage II of the Jordan Valley Irrigation Project (1978-1983)⁸ comprises the construction of the Maqarin Dam and the extension of the East Ghor Canal by 14 km to the northern Dead Sea coast to open new areas for irrigation. Stage II also includes the conversion to sprinkler irrigation of 117,000 dunum of Stage I lands currently irrigated by surface irrigation.

The period 1973-1979 brought 106,470 dunum under irrigation by completion of Stage I projects and added to the 115,000 dunum irrigated by the completion of the East Ghor Canal in October 1961, thus bringing total irrigation capacity to 221,470 dunum.

The projected total irrigation area of 360,000 dunum has subsequently been revised to 310,000 dunum, following the Government's decision to redirect water allocation from irrigation to municipal and industrial uses.⁹

Salt and Keeley (1976) suggest that, given a constant ratio of cultivated area to manpower requirements, the predicted increase in irrigated area from 114,609 dunum in 1973 to 360,000 dunum in 1983 would increase labour demand by 184 per cent. This would represent an increase in the number of farm workers from 28,967 to 82,295 by 1983, that is an increase in labour force to 44,700.¹⁰

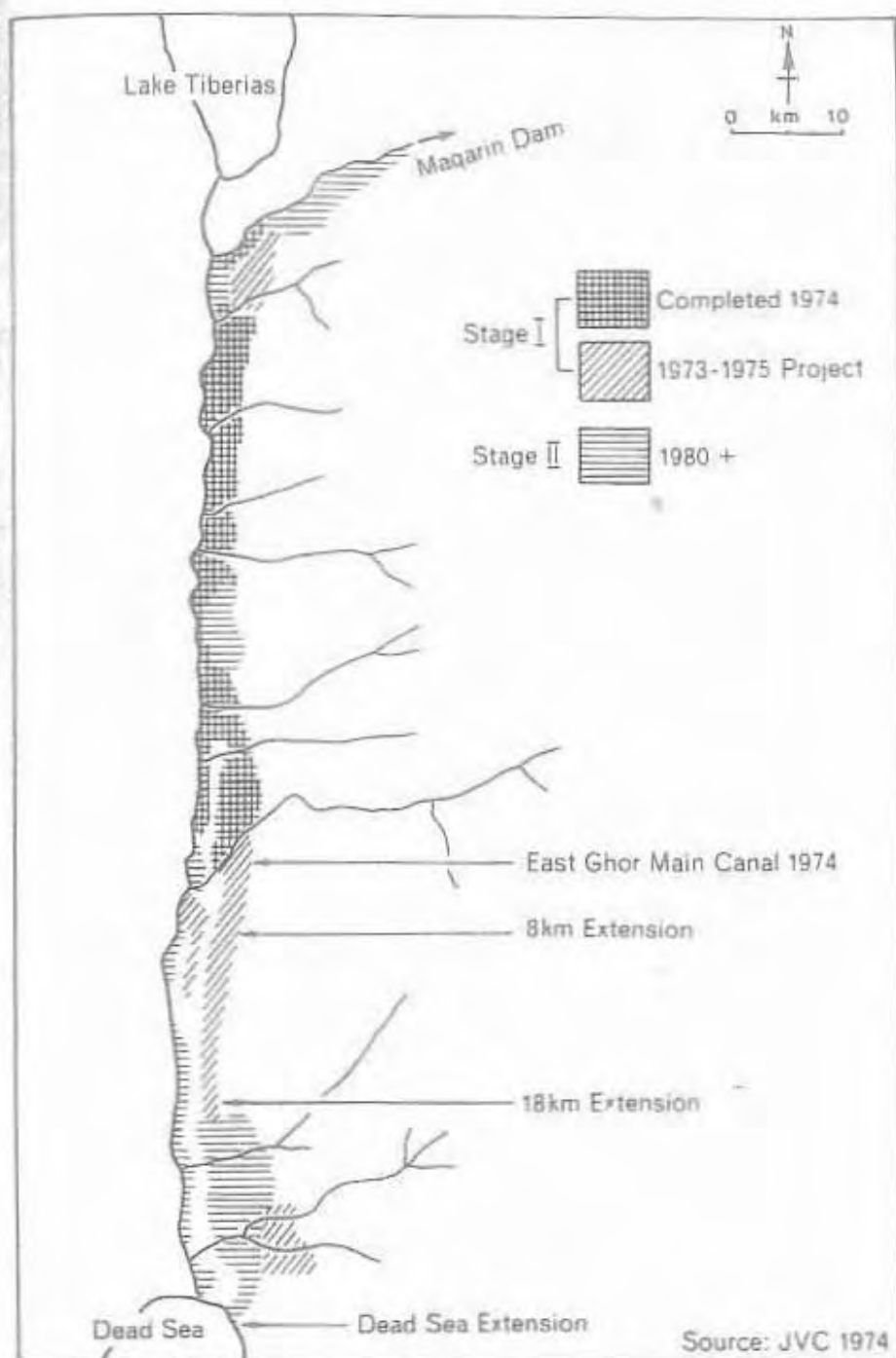


Figure 1. Irrigation development in the East Jordan Valley

These figures must now be regarded as an over-estimate, given that the projected increase has been reduced from 360,000 to 310,000 dunum. Furthermore, delays in project implementation reduce the speed of this increase. Expansion of actual labour requirements will not be proportional to changes in irrigated area alone because of changes in other major variables. In particular, Salt and Keeley suggest a significant increase in labour output per worker over the development period.¹¹

2.3. Land Redistribution

Salt and Keeley argue that the manner in which the irrigated land is divided into farming units will be a major factor influencing future manpower requirements in the East Jordan Valley. Changes in the structure of land holding in accordance with national objectives¹² of redistribution will increase labour requirements through a reduction in the average size of holdings and greater labour intensity of small farms.

Coverage of land reform proposals in the East Jordan Valley Development Plan is limited to a restatement of the Natural Resources Authority Law 12 (1968) and a confirmation that 'all areas irrigated in the 1975-1982 Development Plan will be acquired and redistributed to comply with Law No. 12'.¹³ This redistribution would result in a planned land holding distribution of:

| | |
|----------------|---------------|
| 26 - 40 dunum | 87.2 per cent |
| 41 - 70 dunum | 10.6 per cent |
| 71 - 100 dunum | 2.2 per cent |

Salt and Keeley projected a rise in labour requirements due to changes in the structure of land holdings from 100 to 115 by 1977/78 and thence to 122.5 by 1982/3 (Table 14 line 2). This was based on the assumption of a total irrigated area of 360,000 dunum for redistribution by 1982/3. However, the subsequent reduction of irrigable area to 310,000 dunum and delayed commencement of Stage II irrigation will alter the volume and temporal sequence of these manpower requirements.

Table 15 attempts to project the farm worker requirements by the late 1980s, given the land/labour ratios established by the 1973 survey.¹⁴ It is not clear from the Jordan Valley Development Plan whether the proposed land reform programme will include those lands irrigated by the

TABLE 14 : EAST JORDAN VALLEY : ESTIMATED CHANGES IN LABOUR REQUIREMENTS ON IRRIGATED FARMS, 1976-1989

| Influencing Factor | 1976 | 1977-8 | 1982-3 | 1987-8 | 1989 |
|------------------------------|-------|--------|--------|--------|-------|
| Increase in irrigated area | 100.0 | 166.0 | 284.1 | 284.1 | 284.1 |
| Land redistribution | 100.0 | 115.0 | 122.5 | 122.5 | 122.5 |
| Increased cropping intensity | 100.0 | 100.0 | 110.8 | 125.9 | 125.9 |
| Changed cropping patterns | 100.0 | 97.7 | 96.1 | 96.1 | 96.1 |
| Technological changes | 100.0 | 100.0 | 100.0 | 95.0 | 90.0 |
| TOTAL | 100.0 | 180.5 | 370.6 | 399.9 | 379.0 |

Source: Salt and Keeley, 1976, 82

TABLE 15 : EAST JORDAN VALLEY : PROJECTED FARM LABOUR FORCE, 1973-1988

| | Holdings | Irrigated area (dunum) | Farm Workers |
|--------|----------|------------------------|--------------|
| 1973 | 3,087 | 114,609 | 20,279 |
| 1976 | n.a. | 126,700 | 22,418 |
| 1977/8 | 5,540 | 210,300 | 37,568 |
| 1982/3 | 9,647 | 360,000 | 67,640 |
| 1987/8 | 9,642 | 360,000 | 64,258 |

Source: Salt and Keeley, 1976, 84

East Ghor Canal prior to the 1975-1982 Development Plan. Taking this into consideration, Table 16 presents three scenarios of land holding distribution (column 3 a-c) and the accompanying manpower requirements (column 6 d-f). Calculations are based on the 1973 data for the northern and middle sub-areas of the East Ghor Canal irrigated areas but with a base of 310,000 dunum rather than 114,609 dunum.¹⁵

The following three land redistribution scenarios are presented:

- (i) assumes there is no land redistribution and therefore land will be held in the same pattern as 1973,
- (ii) assumes that the 114,609 dunum pre-1973 irrigated (East Ghor Canal area) remains with its original distribution pattern whilst NRA Law 12 (1968) is applied to the Stage I and Stage II irrigated areas.
- (iii) assumes that all 310,000 dunum (pre-1973 irrigated area plus Stage I and Stage II) are redistributed according to the Jordan Valley Development Plan.

Given these three scenarios, it can be seen (Table 16 Column 7 g-i) that manpower requirements increase by 35,377, 42,829 and 44,402 respectively.

Increases in the farm worker requirements due to land reform (assuming no changes in other variables) in each of the three scenarios are thus:

- (i) no redistribution would increase farm worker requirements by 182 per cent
- (ii) partial redistribution would increase requirements by 220 per cent
- (iii) full redistribution of 310,000 dunum would increase farm worker requirements by 228 per cent by the late 1980s

As Salt and Keeley conclude '... the smaller the average size of holding the higher will be the proportion of labour supplied by self-employed and family farm workers.'¹⁶

Assumptions concerning manpower requirements depend on a successful implementation of the land reform programme. Available data, however, make it difficult to establish de facto changes over

TABLE 16 : EAST JORDAN VALLEY : PROJECTED FARM WORKER REQUIREMENTS BY THE LATE 1960s
ASSUMING VARIOUS LAND DISTRIBUTION PATTERNS

| Holding size ¹ (dunums) | Area irrigated ² by the East Ghor Canal | Projected Irrigated Area ³ | | Average number of workers per 10 dunums, 1973 ⁴ | Estimated ⁵ number of workers on area irrigated by EGC, 1973 |
|---------------------------------------|--|---------------------------------------|---------|--|--|
| | | a. | b. | | |
| Less than 5 | 300 | 806 | 300 | 5.88 | 176 |
| 6-10 | 2,531 | 6,820 | 2,531 | 4.07 | 1,030 |
| 11-15 | 4,806 | 13,020 | 4,806 | 3.74 | 1,797 |
| 16-20 | 4,747 | 12,710 | 4,747 | 2.79 | 1,324 |
| 21-25 | 3,149 | 8,370 | 3,149 | 2.62 | 825 |
| 26-30 | 15,601 | 42,160 | | 2.33 | 3,625 |
| 31-35 | 13,016 | 35,349 | | 2.25 | 2,929 |
| 36-40 | 6,501 | 17,670 | 233,507 | 1.83 | 1,190 |
| 41-45 | 5,043 | 13,640 | | 1.87 | 943 |
| 46-50 | 3,491 | 9,610 | | 1.60 | 558 |
| 51-60 | 9,035 | 24,490 | 28,450 | 1.51 | 1,364 |
| 61-70 | 8,026 | 21,700 | | 1.38 | 1,108 |
| 71-80 | 4,675 | 12,090 | | 1.20 | 537 |
| 81-90 | 5,905 | 15,810 | 5,905 | 1.15 | 679 |
| 91-100 | 1,915 | 5,270 | | 1.23 | 235 |
| 101-150 | 10,998 | 29,760 | 10,998 | 0.93 | 1,023 |
| 151-200 | 5,316 | 14,260 | 5,316 | 0.71 | 377 |
| 201-300 | 4,474 | 12,090 | 4,474 | 0.69 | 309 |
| 301+ | 5,280 | 14,260 | 5,280 | 0.48 | 253 |
| TOTAL | 114,609 | 310,000 | 310,000 | 1.70 | 19,483 |

(contd.)

TABLE 16 (Contd.)

| Holding Size (dumms) | Number of workers required by the late 1980s ^b | | Projected increase in workers ⁷ 1973 - late 1980s | |
|-------------------------|--|--------|---|--------|
| | d. | e. | g. | h. |
| Less than 5 | 474 | 176 | | |
| 6-10 | 2,770 | 1,030 | | |
| 11-15 | 4,869 | 1,797 | | |
| 16-20 | 3,543 | 1,324 | | |
| 21-25 | 2,193 | 825 | | |
| 26-30 | 9,823 | | | |
| 31-35 | 7,951 | 49,971 | | |
| 36-40 | 3,234 | | 57,848 | |
| 41-45 | 2,551 | | | |
| 46-50 | 1,538 | | | |
| 51-60 | 3,098 | 4,524 | 5,225 | |
| 61-70 | 2,995 | | | |
| 71-80 | 1,451 | | | |
| 81-90 | 1,818 | 703 | 812 | |
| 91-100 | 648 | | | |
| 101-150 | 2,768 | 1,023 | | |
| 151-200 | 1,012 | 377 | | |
| 201-300 | 834 | 309 | | |
| 301+ | 684 | 253 | | |
| TOTAL | 54,860 | 62,312 | 35,377 | 42,829 |
| | | | | 44,402 |

(for notes see p.39)

NOTES TO TABLE 10

- i. Column 2. derived from Department of Statistics, 1973, Table 35, column 4
- ii. Column 3. Projected irrigated area:
 - (a) assuming 1973 East Ghor Canal area pattern of distribution.
 - (b) assuming new areas only redistributed.
 - (c) total irrigated area redistributed according to the Jordan Valley Development Plan, 65, Table 11

| Size of holding (ha) | % distribution |
|----------------------|----------------|
| 2.0 - 4.0 | 57.2 |
| 4.1 - 7.0 | 10.6 |
| 7.1 - 10.0 | 2.2 |
- iii. Average number of workers per 10 dunums, 1973 is calculated from Department of Statistics, 1973 Tables 39-42, based on figures for northern and middle areas which are assumed to be more representative of future ratios than the northern East Jordan Valley.
- iv. Column 6. Number of workers required by the late 1980s.
 - (d) assuming 1973 East Ghor Canal area pattern of distribution.
 - (e) assuming new areas only redistributed.
 - (f) total area redistributed according to the Jordan Valley Development Plan.
- v. Column 7. Projected increase in workers 1973 - late 1980s.
 - (g) assuming 1973 East Ghor Canal pattern of distribution
 - (h) assuming new areas only redistributed
 - (i) with total irrigated area redistributed according to the Jordan Valley Development Plan.

the period in question. Data relating to the number of agricultural holdings present a confused picture (Table 17). The sources in table 17 refer to approximately the same geographical area and use the same operational definition but, taking one set of data, we can suggest an increase in the number of agricultural holdings from 4,475 (1973) to 4,519 (1975) and 5,266 (1978).¹⁷ Alternatively, the annual sample surveys indicate a substantial decline in agricultural holdings from 7,873 in 1973 to 6,328 in 1976/79. Hazleton (1980) is similarly inconsistent, suggesting at one point that 'it can be seen that the total number of holdings has risen from 4,519 in 1975 to 5,266 in 1978 or about 17 per cent', while in his conclusion he states that 'there has been a reduction in the total number of agricultural holdings in the East Jordan Valley since 1975'.¹⁸

The author believes that the weight of evidence supports the latter conclusion, since it is derived from the two most comprehensive surveys of the area, the 1975 and 1978 census returns.¹⁹ These are consistent (at least in direction) with the annual sample survey results.

A reduction in the number of agricultural holdings is also consistent with the basic aims of the land reform programme. These can be summarised as limiting the minimum and maximum sizes of land holdings and instituting a programme of land redistribution. The new laws were based on the principle that a 30 dunum holding would be economically viable under the conditions and intensive cultivation foreseen in the Jordan Valley.²⁰ The most significant feature is the prevention of fragmentation once land holdings have been defined and redistributed.

The de jure range in size of agricultural holdings is now 30-200 dunum (but see Table 18), contrasting with the situation in 1955²¹ when 0.17 per cent of landowners held 18 per cent of the land in holdings averaging 10,000 dunum each.

Firky (1979) suggests that the aims of the land reform laws were four-fold:

- (i) to encourage the emergence of owner-operated small family holdings;
- (ii) to enable easier settlement for newcomers;
- (iii) to minimise the hardship of former landowners with large holdings;

TABLE 17 : NUMBER OF AGRICULTURAL HOLDINGS IN THE EAST JORDAN VALLEY 1973-1979: VARIOUS SURVEYS

| | Agricultural ¹ Sample | Department ² of Statistics | Agricultural ³ Census | Jordan ⁴ Valley Plan | Salt ⁵ and Keeley |
|--------|-------------------------------------|---|-------------------------------------|---------------------------------------|------------------------------------|
| 1973 | 7,873 | 4,475 | | | 3,087 |
| 1974 | 7,873 | | | | |
| 1975 | 6,007 | | 6,007 ⁽ⁱ⁾ | 4,519 | |
| 1976 | } 6,326 | | | | 3,415 |
| 1977 | | | | | 5,540 |
| 1978 | | | 5,266 ⁽ⁱⁱ⁾ | | |
| 1979 | | | | | |
| 1982/3 | | | | | 9,647 |

1. Department of Statistics, The Agricultural Sample Survey in the Ghors, Annual, Amman, Table 1
2. Department of Statistics, 1973, Table 11
3. Department of Statistics:
(i) 1977, Table 0.8A
(ii) 1980b, Unpublished preliminary results.
4. Jordan Valley Commission, 1975, C5.
5. Salt and Keeley 1976, 79.

TABLE 18 : SIZE DISTRIBUTION OF AGRICULTURAL HOLDINGS IN THE EAST JORDAN VALLEY 1975 and 1978

| Size of holding (dunums) | 1975 | | 1978 | |
|-----------------------------|--------|-------|-------|-------|
| | No. | % | No. | % |
| 5 d. and less | 147 | 3.3 | 479 | 9.1 |
| 6-10 | 575 | 12.7 | 485 | 9.2 |
| 11-20 | 1,007 | 22.3 | 1,339 | 25.4 |
| 21-40 | 1,550 | 34.3 | 1,820 | 34.6 |
| 41-100 | 1,122 | 24.8 | 896 | 17.0 |
| 101-200 | - | - | 155 | 2.9 |
| over 200 | 118 | 2.6 | 92 | 1.8 |
| TOTAL | 4,519* | 100.0 | 5,266 | 100.0 |

Source: Jordan Valley Authority, 1975, C5 Table 11, Department of Statistics, 1978.

Note: * the Agricultural Census 1975 quotes a figure of 6,007 agricultural holdings (Table 0.8A)

(iv) to diminish the power of large landowners.

Aresvik (1976) has suggested that flexibility in holding size (from 30-200 dunum) has avoided the imposition of strict 'egalitarianism' in the East Jordan Valley, by allowing units to reflect the original holding size.²² Yet, at the same time, it avoids the creation of an entrenched class of large landholders benefiting from the improved agricultural productivity of the area. However, this analysis ignores the social and political reality obtaining in the area. The limited availability of land and the restricted spatial mobility of the local population mean that, in effect, there has been only limited change in the socio-economic conditions of dependency. Strict interpretation of the land reform laws was negated by the re-registration of land among members of a single family.²³

The 1963 land reform law established the following priority for redistribution of appropriated land:

- (i) Owners cultivating their own land in East Ghor Canal Project area.
- (ii) Professional farmers living in the East Ghor Canal Project area.
- (iii) Professional farmers living in the same district.
- (iv) Professional farmers living in other districts
- (v) Holders utilizing their lands by lease or sharecropping within the East Ghor Canal Project area.²⁴

As Hazleton points out, this clearly seeks to '... establish a system of small farms which would be owner-operated.'²⁵ This accounts for the relegation of sharecroppers to the lowest priority for receipt of redistributed lands. Furthermore, an amendment to the original law allows the allocation of separate farm units to individual members of a single family. This clause thus circumvents the aim of limiting the maximum size of a family's holdings. Hazleton suggests that this distorts the data which otherwise appear to show a significant narrowing in the range of holding size and a reduction in the average area of ownership units. In 1977, Article 24 of Law 18 altered the priority for land redistribution by promoting the sharecropper from fifth to second place.²⁶

The 1973 Survey indicated that 59.3 per cent of land holdings were rented on a cash rent or sharecropping basis, an increase of 53.5 per cent over the 1961 level. Furthermore, the proportion of land

sharecropped rose from 39 per cent in 1961 to 47.2 per cent in 1973;²⁸

- (i) 37 per cent of landowners in 1973 were absent from the Valley.
- (ii) 15 per cent of landowners were not farmers.
- (iii) 16 per cent of landowners leased land in excess of that which they could cultivate with family labour.
- (iv) 33 per cent of landowners found it more profitable to lease land.

Pirky (1979) suggests that the large number of Palestinian 'refugee-farmers' from 1948 and 1967 was also a contributory factor to the increase in sharecropping over the period.

Table 19 (a and b) indicates a subsequent reduction in the proportion of sharecropped holdings from 56.3 per cent in 1975 to 54 per cent in 1978 and a corresponding decline in the proportion of the agricultural area sharecropped from 61.8 per cent to 41 per cent. Meanwhile, the proportion of holdings fully owned increased from 34.6 per cent to 42.1 per cent (37.1 per cent to 47.6 per cent of the agricultural area).

Spatial differences are also significant, showing that the proportion of rented holdings still remains very high in the southern areas (63 per cent) compared with the north (45.7 per cent). This reflects the completion of land reform in the northern areas where fully-owned holdings have increased from 39.3 per cent (1973) to 50.7 per cent (1978). In contrast, fully-owned holdings in the south have only increased from 30.8 per cent (1973) to 32.8 per cent (1978).

Sharab (1975)²⁹ shows that, despite the land reform programme, almost 50 per cent of landlords surveyed in the Northern Ghors were residing outside the Valley. Furthermore, at that time, 84 per cent of tenants had only an oral lease made for no more than a single year.³⁰

The East Ghor Canal land reform measures have not succeeded in establishing a pattern of owner-operated farms as the original plan intended. The proportion of sharecroppers remains very high.³¹ Hazleton relates this to the failure to prevent leasing of farm units by beneficiaries of the land redistribution. While the reforms reduced fragmentation of holdings from 2.9 per ownership unit in 1955 to 1.2 fragments in 1971, de facto subdivision exceeds this through the working of joint holdings as sub-units.

TABLE 19 (a) : EAST JORDAN VALLEY : LAND TENURE 1975 (dunums)

| Type of Tenure | Northern Ghor | | Middle Ghor | | Total Valley | |
|----------------|---------------|-------|-------------|-------|--------------|-------|
| | Holdings | % | Area | % | Holdings | % |
| Fully-Owned | 1,366 | 43.2 | 60,106.8 | 45.3 | 2,081 | 34.6 |
| Fully-Rented | 1,427 | 45.1 | 50,637.5 | 38.2 | 3,384 | 56.3 |
| Mixed Tenure | 300 | 9.5 | 20,904.9 | 15.8 | 456 | 7.6 |
| Others | 69 | 2.2 | 919.0 | 0.7 | 86 | 1.4 |
| TOTAL | 3,162 | 100.0 | 132,568.2 | 100.0 | 6,007 | 100.0 |

Source: derived from Department of Statistics, 1977, Table 0.8A.

TABLE 19 (b) : EAST JORDAN VALLEY : LAND TENURE 1978 (dunums)

| Type of Tenure | Northern Ghor | | Middle Ghor | | Total Valley | |
|----------------|---------------|-------|-------------|-------|--------------|-------|
| | Holdings | % | Area | % | Holdings | % |
| Fully-Owned | 1,391 | 50.7 | 43,897.6 | 46.9 | 2,218 | 42.1 |
| Fully-Rented | 1,256 | 45.7 | 40,076.3 | 44.7 | 2,843 | 54.0 |
| Mixed Tenure | 82 | 3.0 | 5,496.2 | 6.1 | 184 | 3.2 |
| Others | 16 | 0.6 | 194.0 | 0.2 | 21 | 0.4 |
| TOTAL | 2,745 | 100.0 | 89,666.1 | 100.0 | 5,266 | 100.0 |

Source: derived from Department of Statistics, 1980, Unpublished preliminary results, hand-tabulated from computer print-outs by the author.

TABLE 20 : EAST JORDAN VALLEY: AVERAGE SIZE OF HOLDING (dunums)
BY TENANCY CATEGORY 1975 AND 1978

| Type of Tenure | 1975 | 1978 |
|----------------|--------|--------|
| Fully Owned | 42.3 | 39.9 |
| Fully Rented | 34.1 | 26.8 |
| Mixed Tenure | 71.8 | 106.1* |
| Others | 30.6 | 17.0 |
| TOTAL | 39.5 * | 35.3 |

Source: Department of Statistics, (i) 1977, Tables 0.8A and 0.9A,
(ii) 1980a, Unpublished preliminary results hand-tabulated
from computer printouts by the author.

* This increase reflects the growth in the proportion of holdings
over 50 per cent rented from an average size of 66.8 dunum in 1975
to 119.8 dunum in 1978.

Table 20 shows a slight decline in the average size of holdings from 39.5 dunum in 1975 to 35.3 dunum in 1978, with over 69 per cent under 40 dunum. More than 45 per cent of holdings are below the minimum recommended size of 30 dunum. Clearly this situation is far from the planned pattern assumed for 1982 by the Jordan Valley Commission.

The implications of what can, at best, be described as a partial success are difficult to assess in terms of farm worker requirements. The failure to achieve owner-operated farming or to reduce fragmentation and joint holdings is aggravated by the omission from the legislation of regulations governing the relationship between landlord and tenant. As detailed above, there has been de facto fragmentation and the number of sharecroppers remains high.

Salt and Keeley suggested that land reform would increase the average size of agricultural holdings and this would increase farm worker demands by reducing the proportion of labour derived from self-employed and family farm workers. In fact, the average size of holding has declined slightly but farm worker demand continues to expand.

Pirky (1979) suggests that, despite the aims of land reform, there will be both a growing reliance on hired labour and a greater demand for sharecroppers.³² Alternatively, one could argue that the nature of technological changes in the farming system combined with the increasing profitability of farming in the Valley may reduce the attractiveness of sharecropping and encourage more landowners to run their holdings through farm managers (with the necessary technical expertise) and hired labour.³³ The current availability of foreign labour together with their reluctance to become sharecroppers, and the lack of Jordanians available for sharecropping (see below) add weight to this conclusion.

2.4. Cropping Intensity and Cropping Patterns

The Jordan Valley Development Plan assumed increases in cropping intensity from 106 per cent in 1975 to 132 per cent by 1988.³⁴ Salt and Keeley suggest that such an increase would induce a growth in labour input requirements by an additional 26 per cent.

Tables 21 (a-e) indicate that there is no clearly discernable trend. Cropping intensity grew as planned from 104.9 per cent in 1975 to 115.4 per cent in 1978 but has subsequently fallen to 104 per cent (1979). Clearly, care should be exercised before accepting the data and

TABLE 21 : CROPS GROWN IN EAST JORDAN VALLEY 1975-1979 (dunums)

(a) 1975

| Crop Group | Northern Chor | | Middle Chor | | Valley Total | |
|-----------------|---------------|-------|-------------|-------|--------------|-------|
| | Area | % | Area | % | Area | % |
| Field Crops | 53,486.7 | 43.7 | 40,148.0 | 41.3 | 93,634.7 | 42.5 |
| Vegetables | 56,973.5 | 46.5 | 57,395.9 | 59.1 | 114,369.4 | 51.9 |
| Fruit | 17,656.8 | 14.4 | 5,377.2 | 5.5 | 23,034.0 | 10.5 |
| Harvested Area | 128,117.0 | 104.6 | 102,921.1 | 105.9 | 231,038.1 | 104.9 |
| Cultivated Area | 122,476.5 | 100.0 | 97,116.6 | 100.0 | 220,140.5 | 100.0 |

(b) 1976

| | | | | | | |
|-----------------|-----------|-------|-----------|-------|-----------|-------|
| Field Crops | 47,040.0 | 36.1 | 42,002.0 | 41.6 | 89,042.0 | 38.5 |
| Vegetables | 88,621.0 | 68.0 | 56,703.3 | 56.2 | 145,324.3 | 62.9 |
| Fruit | 14,523.0 | 11.1 | 7,556.0 | 7.5 | 72,079.0 | 9.5 |
| Harvested Area | 150,184.0 | 115.2 | 106,261.3 | 105.3 | 256,445.3 | 110.9 |
| Cultivated Area | 130,339.8 | 100.0 | 100,845.0 | 100.0 | 231,184.8 | 100.0 |

(c) 1977

| | | | | | | |
|-----------------|-----------|-------|-----------|-------|-----------|-------|
| Field Crops | 35,420.0 | 30.4 | 39,968.0 | 39.0 | 75,388.0 | 34.4 |
| Vegetables | 78,334.0 | 67.3 | 67,889.0 | 66.2 | 146,223.0 | 66.8 |
| Fruit | 24,016.0 | 20.6 | 6,655.0 | 6.5 | 30,671.0 | 14.0 |
| Harvested Area | 137,770.0 | 118.3 | 114,512.0 | 111.7 | 252,282.0 | 115.2 |
| Cultivated Area | 116,460.0 | 100.0 | 102,472.0 | 100.0 | 218,932.0 | 100.0 |

(contd.)

TABLE 21 (contd.)

(d) 1978

| Crop Group | Northern Ghor | | Middle Ghor | | Valley Total | |
|-----------------|---------------|-------|-------------|-------|--------------|-------|
| | Area | % | Area | % | Area | % |
| Field Crops | 27,816.5 | 22.5 | 34,937.5 | 35.1 | 62,754.0 | 28.1 |
| Vegetables | 94,128.9 | 76.1 | 74,339.6 | 74.6 | 168,468.5 | 75.5 |
| Fruit | 25,400.2 | 20.5 | 7,569.9 | 7.6 | 32,970.1 | 14.8 |
| Harvested Area | 147,345.6 | 119.2 | 116,847.0 | 117.3 | 264,192.6 | 118.4 |
| Cultivated Area | 123,623.8 | 100.0 | 99,632.1 | 100.0 | 233,255.9 | 100.0 |

(e) 1979

| | | | | | | |
|-----------------|-----------|-------|-----------|-------|-----------|-------|
| Field Crops | 23,980.3 | 18.4 | 19,985.4 | 19.2 | 43,965.7 | 18.8 |
| Vegetables | 86,348.5 | 66.2 | 82,399.0 | 79.2 | 168,747.5 | 72.0 |
| Fruit | 25,957.6 | 19.9 | 6,948.5 | 6.7 | 32,906.1 | 14.0 |
| Harvested Area | 136,286.4 | 104.5 | 109,332.9 | 105.1 | 245,637.3 | 104.8 |
| Cultivated Area | 130,376.7 | 100.0 | 104,017.7 | 100.0 | 234,394.4 | 100.0 |

Source: derived from Department of Statistics, 1976b and 1977-1980. Various tables.

implications of these sample surveys. Full analysis will not be possible until the publication of the 1978 Agricultural Census results.

Table 22 shows that, despite expansion of the irrigated area, production levels continue to fluctuate annually, though the trend is slightly upward, probably varying with attainable price and water availability.³⁵ However, this aggregate picture ignores the extent to which yields vary within the Valley. Hazleton (1980) provides data from the Northern Ghor (1971-1977) to show that vegetable yields appear to have stagnated since the completion of the East Ghor Main Canal in the 1960s. This implies that increased production relates entirely to the increase in irrigated area and not to the introduction of more efficient and productive agricultural systems. Yields continue to be well below those attained in other irrigated areas such as the Nile Valley.³⁶

Calculation of average yields and cropping intensity may present a misleading picture because of the range in production methods from low-yielding traditional practices to modern, capital-intensive, highly productive agriculture. Table 23 indicates that the range in yields from different farming units is very wide. Yields fluctuate markedly between seasons and within different sub-areas of the Valley. USAID describe this range of yields and production levels as one of the most outstanding features of agricultural production in the Jordan Valley: 'Farmers in the same vicinity attain quite different levels of production in the same season and under similar soil and environmental conditions'.

These ranges have been attributed by Steitieh³⁷ to three major factors:

- (i) the variety of productive inputs used, both in terms of quantity and quality. This is a reflection of the inequitable access to capital resources which obtains in the region.
- (ii) Some of the high levels of production reflect a growth in 'plasticulture' and may represent future potential levels of production for greater areas of the Valley.³⁸
- (iii) the limited assistance given to farmers by Government organizations to deal with their economic and technical problems.

TABLE 22 : EAST JORDAN VALLEY: PRODUCTION LEVELS OF MAIN CROPS
1974-1979 (000 tons)

| Crop | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 |
|----------------------------|------|-------|------|------|-------|-------|
| Tomatoes | 84.7 | 101.5 | 69.1 | 66.3 | 165.2 | 138.2 |
| Eggplant | 30.8 | 36.9 | 41.5 | 23.3 | 61.6 | 49.9 |
| Cucumber | 1.4 | 9.9 | 9.0 | 6.0 | 17.0 | 13.4 |
| Squash | 4.7 | 11.4 | 14.5 | 25.4 | 40.8 | 37.7 |
| Cauliflower and cabbage | 10.2 | 4.2 | 1.2 | 5.3 | 24.3 | 11.5 |
| Potato | 3.3 | 4.0 | 10.7 | 11.7 | 7.8 | 6.2 |
| Pepper | 2.6 | 4.3 | 2.3 | 4.8 | 4.8 | 6.6 |
| Wheat | 16.8 | 7.7 | 11.3 | 4.9 | 6.5 | 1.1 |

Source: derived from Department of Statistics. Agricultural Sample Survey of the Ghors 1974-1979. Various tables

TABLE 23 : EAST JORDAN VALLEY: RANGE OF AVERAGE YIELDS
1974-1979 (kg/dunum)

| Crop | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 |
|----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Tomatoes | 859- 1,030 | 1,734- 1,796 | 930- 1,252 | 903- 1,252 | 2,431- 2,460 | 1,757- 2,447 |
| Eggplant | 610- 878 | 1,740- 1,862 | 1,510- 1,850 | 1,001- 1,240 | 2,123- 2,142 | 1,583- 1,903 |
| Cucumber | 409- 436 | 1,270- 1,444 | 868- 1,092 | 821- 1,061 | 1,242- 1,801 | 1,249- 1,688 |
| Squash | 521- 1,190 | 1,128- 1,199 | 611- 684 | 931- 1,253 | 1,563- 1,942 | 1,485- 1,500 |
| Cauliflower and cabbage | 2,451- 2,868 | 2,877- 3,407 | 1,561- 1,666 | 1,215- 2,933 | 2,900- 4,758 | 1,264- 1,448 |
| Citrus | 1,032- 1,342 | 932- 1,147 | 1,394- 1,450 | 1,569- 2,142 | 1,844- 2,147 | 1,390- 1,393 |

Source: Hazleton, 1980, 10, Table 5 Unpublished manuscript

Furthermore, a number of institutional measures, such as the formation of the Jordan Valley Farmers Association, the establishment of packing and grading centres and the conversion from surface to sprinkler irrigation will have an effect on improving conditions and productivity over the next few years.

Given the unsatisfactory nature of the available data with regard to crop production and yields, the author refrains from making firm conclusions as to the impact of improved cropping intensity on manpower requirements. It would appear logical that cropping intensity alone will not increase without significant changes in cropping patterns and technology. The latter will be examined in more detail in the sections which follow.

The Jordan Valley Development Plan 1975-1982 sought the regulation of cropping patterns and cropping intensity on a planned basis (Table 2a). This section compares this ideal with the evolving pattern 1975-1979. Tables 21 (a-e) show the cropping patterns 1975-1979 by sub-district. Note that the 1975 data are drawn from the Agricultural Census and are widely regarded as more reliable and internally consistent than the data base for subsequent years, which has been abstracted from the Annual Sample Survey in the Ghors. The sample comprises only 6 per cent (418) of the holdings recorded in the 1975 Agricultural Census.

Over the period 1975-1979, total field crop area had declined by 53 per cent (49,669 dunum) from 93,434.7 dunum (42.5 per cent) to 43,965.7 dunum (18.8 per cent). This decline was most significant in the Northern Ghor during the period 1975-1978 where the main irrigation projects had been completed. Thus a reduction in field crop area from 43.7 per cent (53,486.7 dunum) to 22.5 per cent (27,816.5 dunum) had been realised by 1978, an overall fall of 25,670.2 dunum (48 per cent).

Simultaneously, the decline in the Middle Ghor was only 5,210.5 dunum (13.0 per cent), from 40,148 dunum (41.3 per cent) to 34,937.5 dunum (35 per cent). Subsequently, a 42.6 per cent (14,952.1 dunum) decline to 19.2 per cent (19,985.4 dunum) during the 1978-79 season followed the completion of the Stage I projects.

The 1979 Sample Survey (Table 21) shows that field crop areas are now similar in both Ghors (18.4 per cent and 19.2 per cent). The decline in field crop area is dominated by a 60 per cent fall in wheat area from 59,382 dunum in 1975 to 28,093 dunum in 1979, although it continues to comprise over 60 per cent of the total field crop area. The absolute

TABLE 24 : EAST JORDAN VALLEY: PROJECTED IRRIGATED AND CROPPED AREA 1976-1989 (000 dunum)

| | Irrigated Area | | Cropped Area | | | | | | | | | | Grand Total |
|------|----------------|-----------|--------------|--------------------|---------|--------|----------------------|-------|---------|--------|-------|--------|----------------|
| | Surface | Sprinkler | Total | Surface Irrigation | | | Sprinkler Irrigation | | | | Total | | |
| | | | | Veg. | Cereals | Fruits | Total | Veg. | Cereals | Fruits | | Fodder | |
| 1976 | 126.7 | - | 126.7 | 88.7 | 20.3 | 25.3 | 134.3 | - | - | - | - | - | 134.3 |
| 1977 | 126.7 | 35.0 | 161.7 | 90.5 | 20.7 | 25.7 | 136.7 | 21.8 | 7.3 | 1.5 | 2.2 | 32.9 | 169.8 |
| 1978 | 126.7 | 83.0 | 210.3 | 92.2 | 21.0 | 26.1 | 139.4 | 52.9 | 17.7 | 5.2 | 7.6 | 83.4 | 222.8 |
| 1979 | 126.7 | 83.0 | 210.3 | 94.0 | 21.4 | 26.5 | 141.9 | 54.6 | 18.2 | 8.9 | 12.6 | 94.5 | 236.4 |
| 1980 | 126.7 | 83.0 | 210.3 | 95.8 | 21.8 | 26.9 | 144.4 | 54.4 | 18.1 | 12.6 | 18.2 | 103.3 | 247.7 |
| 1981 | 126.7 | 83.0 | 210.3 | | | | | 52.2 | 17.5 | 16.3 | 22.5 | 109.4 | 253.9 |
| 1982 | 126.7 | 83.0 | 210.3 | | | | | 50.8 | 16.9 | 18.4 | 26.6 | 112.7 | 257.1 |
| 1983 | 126.7 | 233.3 | 360.0 | | | | | 149.1 | 49.8 | 22.9 | 36.7 | 258.6 | 403.0 |
| 1984 | 126.7 | 233.3 | 360.0 | | | | | 151.6 | 50.7 | 27.5 | 46.9 | 276.6 | 421.0 |
| 1985 | 126.7 | 233.3 | 360.0 | | | | | 153.8 | 51.4 | 32.0 | 57.0 | 294.3 | 438.7 |
| 1986 | | | | | | | | 149.6 | 50.0 | 36.2 | 67.1 | 302.9 | 447.4 |
| 1987 | | | | | | | | 145.8 | 48.7 | 41.1 | 77.3 | 312.9 | 457.4 |
| 1988 | | | | | | | | 144.3 | 48.2 | 41.1 | 77.3 | 310.9 | 455.4 |
| 1989 | | | | | | | | 142.3 | 47.7 | 41.1 | 77.3 | 308.9 | 453.4 |

Source: Salt and Keeley, 1976, Appendix 17

decline in the area of barley has been much less significant (from 17,229 dunum in 1975 to 12,815 dunum in 1979) and its relative share of field crop area has increased from 18.4 per cent to 29.1 per cent (Table 25).

This decline in field crop area should be compared with the planned cropping pattern as projected by the Jordan Valley Commission (Table 29). The Plan envisaged an increase in field crop area (cereals and fodder crops) to 50.6 per cent; in particular the proportion used for fodder crops was to expand from nil to some 11.0 per cent of the total cultivated area in the East Jordan Valley.

The major departure from this planned cropping pattern is the discontinuity of fodder production. The 1979 Sample Survey (Table 20) indicates that no alfalfa was recorded in the region during the 1978-1979 season, despite the Plan's projection of alfalfa to 13.2 per cent of total cultivated area. By 1979, only some 1,117 dunum of fodder crops (clover, vetches and maize) were cultivated, accounting for less than 0.5 per cent of the harvested area compared to the 2,242.6 dunum in 1975 (1 per cent of harvested area).

The Jordan Valley Commission argued that expansion of fodder crops was '... compatible with the Government policy to increase livestock production in general and dairying in particular'. However, Mazur (1979) suggested that the '... economic merit of the planned expansion in beef and dairy production has not been established'.³⁹ Mazur called for a re-examination of the fodder projections, given the likely curtailment of the Government's planned expansion of livestock production.

Overall, in 1979, field crop area amounted to 18.8 per cent of the cultivated area, compared with the projected 49.6 per cent. Furthermore, field crops are, in economic terms, much less important than indicated by the area cultivated, since they constitute only 4-5 per cent of the gross value of production from the East Jordan Valley.⁴⁰

Concomitant with the decline in field crop production is the substantial increase in the cropped area devoted to vegetable production. The latter has increased by 47.5 per cent (54,376.1 dunum) from 114,369.4 dunum in 1975 to 168,745.5 dunum in 1979. This represents an increase from 52 per cent to 72 per cent of the total cultivated area.

As Table 26 shows, this increase in the vegetable area also has marked spatial and temporal characteristics. As in the previous discussion, changes in the Northern Ghor came earlier in the period.

TABLE 25 : EAST JORDAN VALLEY: FIELD CROP SECTOR, CROPPED AREA (dunums), 1975-1979

| | 1975 | | 1976 | | 1977 | | 1978 | | 1979 | | 1975-1979 % Change |
|-------------------------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|-----------------------|
| | Area | % | Area | % | Area | % | Area | % | Area | % | |
| Wheat | 69,382.5 | 74.1 | 62,075.0 | 69.7 | 51,469.0 | 68.3 | 42,513.0 | 67.7 | 26,093.2 | 63.9 | -59.5 |
| Barley | 17,229.0 | 18.4 | 20,460.0 | 23.0 | 16,783.0 | 22.3 | 17,650.0 | 28.1 | 12,814.7 | 29.1 | -25.5 |
| Maize | 1,268.0 | 1.4 | 3,740.0 | 4.2 | 987.0 | 1.2 | 492.2 | 0.8 | 622.7 | 1.4 | -51.0 |
| Others | 5,755.2 | 6.1 | 2,767.0 | 3.1 | 6,149.0 | 8.2 | 2,098.5 | 3.3 | 2,435.1 | 5.5 | -57.7 |
| TOTAL FIELD CROPS | 93,534.7 | 100.0 | 89,042.0 | 100.0 | 75,386.0 | 100.0 | 62,754.0 | 100.0 | 43,965.7 | 100.0 | -53.0 |

Source: derived from Department of Statistics, 1977-1980, Various tables

1975 data are drawn from Department of Statistics 1976b, Various tables

TABLE 26 : EAST JORDAN VALLEY: CHANGE IN CROPPED AREA OF THE VEGETABLE SECTOR 1975-1979 BY SUB-DISTRICT (dunum)

| | Northern Ghor | | Middle Ghor | | Total Valley | |
|------|----------------|----------|----------------|----------|----------------|----------|
| | Harvested Area | % Change | Harvested Area | % Change | Harvested Area | % Change |
| 1975 | 56,973.5 | - | 57,395.9 | - | 114,309.4 | - |
| 1976 | 88,621.0 | + 55 | 56,703.3 | - 1.2 | 145,324.3 | + 27.1 |
| 1977 | 78,334.0 | - 11.6 | 67,889.0 | +19.7 | 146,223.0 | + 0.6 |
| 1978 | 94,128.9 | + 13.0 | 74,399.0 | + 9.5 | 168,468.5 | + 15.2 |
| 1979 | 86,348.5 | - 8.0 | 82,399.0 | +10.8 | 168,747.5 | + 0.2 |

Source: derived from Department of Statistics, The Agricultural Sample Survey in the Ghors, 1975-1979, Various tables.

1975 data from Department of Statistics 1976b, Various tables.

TABLE 27 : EAST JORDAN VALLEY: VEGETABLE SECTOR, CROPPED AREA 1975-1979 (dunums)

| | 1975 | | 1976 | | 1977 | | 1978 | | 1979 | | 1975-1979 | |
|-------------------------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|--|
| | Area | % | Area | % | Area | % | Area | % | Area | % | % change | |
| Tomatoes | 38,026.4 | 33.2 | 47,092.0 | 32.4 | 51,789.0 | 35.4 | 59,100.0 | 35.1 | 52,064.9 | 30.8 | + 37.0 | |
| Eggplant | 18,202.5 | 15.9 | 24,327.8 | 16.7 | 19,486.0 | 13.3 | 25,377.0 | 15.1 | 27,570.8 | 16.3 | + 51.5 | |
| Squash | 9,985.7 | 8.7 | 2,330.0 | 1.6 | 22,616.0 | 15.5 | 23,982.7 | 14.2 | 25,285.1 | 14.9 | + 153.0 | |
| Cucumber | 7,328.5 | 6.4 | 9,113.0 | 6.3 | 6,105.0 | 4.2 | 10,970.0 | 6.5 | 9,654.6 | 5.7 | + 31.7 | |
| Cauliflower and cabbage | 2,499.0 | 2.2 | 1,580.0 | 1.1 | 3,431.0 | 2.3 | 10,495.7 | 6.2 | 8,057.8 | 4.8 | + 222.4 | |
| Beans | 7,815.5 | 6.8 | 9,712.5 | 6.7 | 12,682.0 | 8.7 | 9,032.0 | 5.4 | 16,503.2 | 9.8 | + 111.2 | |
| Peppers | 3,394.0 | 3.0 | 5,731.0 | 3.9 | 6,486.0 | 4.4 | 6,487.6 | 3.9 | 9,625.4 | 5.7 | + 183.6 | |
| Potatoes | 3,220.2 | 2.8 | 7,436.0 | 5.1 | 10,410.0 | 7.1 | 5,932.5 | 3.5 | 4,041.3 | 2.4 | + 25.5 | |
| Melons | 1,776.4 | 1.5 | 8,120.0 | 5.6 | 5,426.0 | 3.7 | 4,754.6 | 2.8 | 2,117.6 | 1.2 | + 19.2 | |
| Others | 22,121.4 | 19.3 | 29,882.0 | 20.6 | 7,792.0 | 5.3 | 12,298.2 | 7.3 | 13,854.3 | 8.2 | - 37.4 | |
| TOTAL | 114,369.4 | 100.0 | 145,324.3 | 100.0 | 146,223.0 | 100.0 | 168,468.5 | 100.0 | 168,747.5 | 100.0 | + 47.5 | |

Source: derived from Department of Statistics, 1977-1979, Various tables.

1975 data from Department of Statistics 1976b

Data suggest a massive 55 per cent increase 1975-1976 with a subsequent levelling off.⁴¹

In the Middle Ghor, the increase began in the 1976-1977 season and made steady progress thereafter to reach 82,399 dunum in 1979, some 79.2 per cent of the total cultivated area. This may reflect the recent spatial concentration of 'plasticulture' technology within the sub-districts of Deir Alla and Shuna Janobia (see below). Table 27 examines changes within the vegetable sector in some detail. Increases in area are noted throughout the sector while proportions remain relatively constant. The sector continues to be dominated by tomatoes (30.8 per cent), eggplants (16.3 per cent) and squash (14.9 per cent). However, tomatoes have been losing their dominance in relation to crops such as eggplants, squash and beans.

Spatial differences (Table 28) are again important to the analysis which follows. In particular, note the dominance of certain labour intensive crops in the Middle Ghor, while the Northern Ghor is dominated by less labour intensive crops (cabbage, cauliflower, beans and potatoes).

A less dramatic increase has been recorded with regard to fruit production; clearly there is a lag between an increase in area of fruit crops and increased production. Harvested areas of fruit crops have increased from 10.5 per cent of the total area in 1975 to 14 per cent in 1979. Fruit crops remain predominantly concentrated in the Northern Ghor, which accounts for 79 per cent of the total area.

Hazleton (1980) predicts that the increased rains⁴² of 1979-1980 will allow full irrigation of the Stage I lands during the 1980-1981 cropping season and the introduction of sprinkler irrigation throughout the Valley. This will promote a rise in cropping intensity and further moves away from field crops to more profitable vegetable and fruit production.

Table 29 indicates the planned cropping pattern as projected by the Jordan Valley Commission (1975). The land use plan reveals that the proportion of area devoted to vegetable production was to decrease from 70 per cent to 56.2 per cent, while fodder crop production was to expand from nil to some 31 per cent, of the total cultivated area. In contrast to the planned cropping pattern, there has been a considerable increase in the cultivated area devoted to vegetable production beyond the 56.2 per cent planned for 1982. Given the expanding regional market

TABLE 28 : EAST JORDAN VALLEY: VEGETABLE SECTOR CROPPED AREA
1979 BY SUB-DISTRICT (dunums)

| | Northern Ghor | | Middle Ghor | |
|---------------------------------------|---------------|-------------------|-------------|------|
| | Area | % | Area | % |
| Tomatoes | 26,351.8 | 50.6 | 25,713.1 | 49.4 |
| Eggplants | 10,516.4 | 48.0 | 17,054.4 | 62.0 |
| Squash | 13,932.4 | 55.2 | 11,325.7 | 44.8 |
| Cucumber | 3,105.1 | 42.0 ^a | 6,549.5 | 68.0 |
| Cauliflower and Cabbage | 7,481.7 | 93.0 | 576.1 | 7.0 |
| Beans | 10,313.6 | 62.5 | 6,189.6 | 37.5 |
| Peppers | 5,105.6 | 53.0 | 4,519.8 | 47.0 |
| Potatoes | 3,972.0 | 98.3 | 69.3 | 1.7 |
| Melon | 144.9 | 7.0 | 3,729.0 | 93.0 |
| Others | 7,162.7 | 51.7 | 6,691.6 | 48.3 |
| Total Vegetable Cropped Area | 86,348.5 | 51.2 | 82,399.0 | 48.8 |

Source: derived from Department of Statistics. Agricultural Sample Survey in the Ghors 1979. February 1980, Various tables.

for vegetable and fruit production, together with the natural advantages of the East Jordan Valley, the Government's continued neglect of the livestock sector and the need for high returns from production, the failure to meet this planned level of fodder production is hardly surprising, especially since decision-making remains with the individual landowner and tenant.

The importance of these departures from the Plan in the context of this thesis are their implications for manpower requirements. Salt and Keeley (1976) based their discussion of manpower needs on the Jordan Valley Commission plan and suggested that the cropping patterns projected for full development (Table 29) would have a negative effect on daily labour requirements (Table 14 above), reducing demand slightly from 100 in 1976 to 96.1 by 1982-1983. This results from the projected decline in the proportion of vegetable and fruit production, concomitant with the introduction of less labour-intensive fodder crops.

Whilst Salt and Keeley concluded that the combined impact of the five major variables discussed would be to increase total labour requirements substantially (from 100 in 1976 to 370.6 by 1982-1983), within this overall increase, changed cropping patterns and technological changes are shown to reduce their labour requirements.

2.5. Technological Change

Dar-al-Handasah (1977) suggest that there are '... significant opportunities for reducing labour inputs in the Jordan Valley while maintaining or increasing yields'. This forms the fifth of Salt and Keeley's factors influencing the manpower requirements of agricultural development in the Jordan Valley. The introduction of improved technology was assumed significantly to increase output per unit of labour input. However, it was recognised that any reduction in labour requirements through increased mechanization would in all probability be offset by more intensive agricultural practices and increased harvesting requirements. Thus Table 14 (line 5) indicates a 10 per cent reduction in labour demand by 1999 following the full introduction of technological developments.

Average labour inputs under the traditional surface irrigation system (dawaleeb) have been calculated (1977) to be 130 man-hours per dunum comprising 68 man-hours per dunum for cultivation/plant care and

TABLE 29 : EAST JORDAN VALLEY : PROJECTED CROPPING PATTERN 1982;
ACTUAL PATTERN 1979

| | % Cropped Area 1982 ¹ | % 1979 ² |
|---------------------|----------------------------------|---------------------|
| Tomatoes | 21.7 | |
| Eggplant | 9.7 | |
| Cabbage/Cauliflower | 5.2 | |
| Onions | 2.6 | |
| Potatoes | 3.2 | |
| Squash/Cucumber | 4.6 | |
| Beans | 7.0 | |
| Sweet Pepper | 2.2 | |
| VEGETABLES | 56.2 | 72.0 |
| Bananas | 4.8 | |
| Citrus | 9.0 | |
| FRUIT | 13.8 | 14.0 |
| Wheat and Barley | 7.7 | 18.8 |
| Maize | 11.5 | |
| CEREALS | 18.8 | |
| Alfalfa | 13.2 | |
| Berseem | 8.2 | |
| Fodder Maize | 8.8 | |
| FODDER | 30.8 | |

Source: 1. Jordan Valley Commission, 1975, A19, table 7

2. derived from Department of Statistics, The Agricultural Sample Survey in the Ghors 1979, Various tables, February 1980.

62 man-hours per dunum for crop harvesting. Dar-al-Handasah predicted a reduction to 88 man-hours per dunum through : (i) improved labour efficiency and (ii) increased use of machinery (including sprinkler irrigation). In particular, the replacement of the traditional furrow pattern by straight furrow irrigation was to reduce labour requirements by 25 per cent per irrigated dunum. The traditional system required 0.1 man-days per irrigation 'turn' together with 1.5 man-days per dunum digging. In contrast, straight furrowing only requires 0.1 man-days per dunum in total, following levelling and mechanized furrowing.

A number of significant factors have distorted this planned reduction in labour input:

- (i) the delayed introduction of sprinkler irrigation because of limited water availability following five years of drought.⁴³
- (ii) the limited success of the land reform programme in the northern Valley. Over much of the southern Valley the programme is still pending or has not been implemented. Thus there remain many holdings of uneconomic size for mechanization and lacking the capital for its introduction.
- (iii) several of the measures projected in the Jordan Valley Development Plan have yet to show their impact on improving conditions and productivity. As yet, farm machinery is not available on a co-operative basis as planned.

Given the expansion in irrigated area, cropping intensity and the continued predominance of labour intensive vegetable crops, these additional factors (i-iii) have necessarily meant increased labour demand. The most significant factor of increasing importance has been

- (iv) the rapid expansion in 'plastic agriculture', that is the cultivation of vegetables (predominantly cucumber and tomatoes) under plastic tunnels and houses. These have increased dramatically in area since their introduction in 1975. In 1977 plastic covers comprised

TABLE 30 : CHANGE IN VEGETABLE CROP AREA OVER THE TWO SEASONS
1977/78 and 1978/79 IN THE EAST JORDAN VALLEY (dunums)

| | Tunnels | | | Houses | | |
|------------|---------|---------|---------|--------|---------|-------|
| | Drip | Surface | Total | Drip | Surface | Total |
| 1977/78 | 385.0 | 3,410.0 | 3,795.0 | 106.0 | 179.0 | 285.5 |
| 1978/79 | 1,595.0 | 4,420.0 | 6,015.0 | 324.0 | 417.3 | 741.3 |
| % Increase | 314.0 | 30.0 | 58.0 | 204.0 | 33.0 | 160.0 |

Source: Steitieh and Musa, 1980, 34, Table 12

decline in the area of barley has been much less significant (from 17,229 dunum in 1975 to 12,815 dunum in 1979) and its relative share of field crop area has increased from 18.4 per cent to 29.1 per cent (Table 25).

This decline in field crop area should be compared with the planned cropping pattern as projected by the Jordan Valley Commission (Table 29). The Plan envisaged an increase in field crop area (cereals and fodder crops) to 50.6 per cent; in particular the proportion used for fodder crops was to expand from nil to some 31.0 per cent of the total cultivated area in the East Jordan Valley.

The major departure from this planned cropping pattern is the discontinuity of fodder production. The 1979 Sample Survey (Table 20) indicates that no alfalfa was recorded in the region during the 1978-1979 season, despite the Plan's projection of alfalfa to 13.2 per cent of total cultivated area. By 1979, only some 1,117 dunum of fodder crops (clover, vetches and maize) were cultivated, accounting for less than 0.5 per cent of the harvested area compared to the 2,242.6 dunum in 1975 (1 per cent of harvested area).

The Jordan Valley Commission argued that expansion of fodder crops was '... compatible with the Government policy to increase livestock production in general and dairying in particular'. However, Mazur (1979) suggested that the '... economic merit of the planned expansion in beef and dairy production has not been established'.³⁹ Mazur called for a re-examination of the fodder projections, given the likely curtailment of the Government's planned expansion of livestock production.

Overall, in 1979, field crop area amounted to 18.8 per cent of the cultivated area, compared with the projected 49.6 per cent. Furthermore, field crops are, in economic terms, much less important than indicated by the area cultivated, since they constitute only 4-5 per cent of the gross value of production from the East Jordan Valley.⁴⁰

Concomitant with the decline in field crop production is the substantial increase in the cropped area devoted to vegetable production. The latter has increased by 47.5 per cent (54,376.1 dunum) from 114,369.4 dunum in 1975 to 168,745.5 dunum in 1979. This represents an increase from 52 per cent to 72 per cent of the total cultivated area.

As Table 26 shows, this increase in the vegetable area also has marked spatial and temporal characteristics. As in the previous discussion, changes in the Northern Ghor came earlier in the period.

TABLE 25 : EAST JORDAN VALLEY: FIELD CROP SECTOR, CROPPED AREA (dunums), 1975-1979

| | 1975 | | 1976 | | 1977 | | 1978 | | 1979 | | 1975-1979 % Change |
|-------------------------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|-----------------------|
| | Area | % | Area | % | Area | % | Area | % | Area | % | |
| Wheat | 69,382.5 | 74.1 | 62,075.0 | 69.7 | 51,469.0 | 68.3 | 42,513.0 | 67.7 | 28,093.2 | 63.9 | -59.5 |
| Barley | 17,229.0 | 18.4 | 20,460.0 | 23.0 | 16,783.0 | 22.3 | 17,650.0 | 28.1 | 12,814.7 | 29.1 | -25.5 |
| Maize | 1,268.0 | 1.4 | 3,740.0 | 4.2 | 987.0 | 1.2 | 492.2 | 0.8 | 622.7 | 1.4 | -51.0 |
| Others | 5,755.2 | 6.1 | 2,767.0 | 3.1 | 6,149.0 | 8.2 | 2,098.5 | 3.3 | 2,435.1 | 5.5 | -57.7 |
| TOTAL FIELD CROPS | 93,534.7 | 100.0 | 89,042.0 | 100.0 | 75,388.0 | 100.0 | 62,754.0 | 100.0 | 43,965.7 | 100.0 | -53.0 |

Source: derived from Department of Statistics, 1977-1980, Various tables

1975 data are drawn from Department of Statistics 1976b, Various tables

TABLE 26 : EAST JORDAN VALLEY: CHANGE IN CROPPED AREA OF THE
VEGETABLE SECTOR 1975-1979 BY SUB-DISTRICT (dunum)

| | Northern Ghor | | Middle Ghor | | Total Valley | |
|------|-------------------|-------------|-------------------|-------------|-------------------|-------------|
| | Harvested Area | % Change | Harvested Area | % Change | Harvested Area | % Change |
| 1975 | 56,973.5 | - | 57,395.9 | - | 114,309.4 | - |
| 1976 | 88,621.0 | + 55 | 56,703.3 | - 1.2 | 145,324.3 | + 27.1 |
| 1977 | 78,334.0 | - 11.6 | 67,889.0 | +19.7 | 146,223.0 | + 0.6 |
| 1978 | 94,128.9 | + 13.0 | 74,399.0 | + 9.5 | 168,468.5 | + 15.2 |
| 1979 | 86,348.5 | - 8.0 | 82,399.0 | +10.8 | 168,747.5 | + 0.2 |

Source: derived from Department of Statistics, The Agricultural Sample
Survey in the Ghors, 1975-1979, Various tables.

1975 data from Department of Statistics 1976b, Various tables.

TABLE 27 : EAST JORDAN VALLEY: VEGETABLE SECTOR, CROPPED AREA 1975-1979 (dunums)

| | 1975 | | 1976 | | 1977 | | 1978 | | 1979 | | 1975-1979 | |
|-------------------------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|--|
| | Area | % | Area | % | Area | % | Area | % | Area | % | % change | |
| Tomatoes | 38,026.4 | 33.2 | 47,092.0 | 32.4 | 51,789.0 | 35.4 | 59,100.0 | 35.1 | 52,064.9 | 30.8 | + 37.0 | |
| Eggplant | 18,202.5 | 15.9 | 24,327.8 | 16.7 | 19,486.0 | 13.3 | 25,377.0 | 15.1 | 27,570.8 | 16.3 | + 51.5 | |
| Squash | 9,985.7 | 8.7 | 2,330.0 | 1.6 | 22,616.0 | 15.5 | 23,982.7 | 14.2 | 25,285.1 | 14.9 | + 153.0 | |
| Cucumber | 7,328.5 | 6.4 | 9,113.0 | 6.3 | 6,105.0 | 4.2 | 10,970.0 | 6.5 | 9,654.6 | 5.7 | + 31.7 | |
| Cauliflower and cabbage | 2,499.0 | 2.2 | 1,580.0 | 1.1 | 3,431.0 | 2.3 | 10,495.7 | 6.2 | 8,057.8 | 4.8 | + 222.4 | |
| Beans | 7,815.5 | 6.8 | 9,712.5 | 6.7 | 12,682.0 | 8.7 | 9,032.0 | 5.4 | 16,503.2 | 9.8 | + 111.2 | |
| Peppers | 3,394.0 | 3.0 | 5,731.0 | 3.9 | 6,486.0 | 4.4 | 6,487.6 | 3.9 | 9,625.4 | 5.7 | + 183.6 | |
| Potatoes | 3,220.2 | 2.8 | 7,436.0 | 5.1 | 10,410.0 | 7.1 | 5,932.5 | 3.5 | 4,041.3 | 2.4 | + 25.5 | |
| Melons | 1,776.4 | 1.5 | 8,120.0 | 5.6 | 5,426.0 | 3.7 | 4,754.6 | 2.8 | 2,117.6 | 1.2 | + 19.2 | |
| Others | 22,121.4 | 19.3 | 29,882.0 | 20.6 | 7,792.0 | 5.3 | 12,298.2 | 7.3 | 13,854.3 | 8.2 | - 37.4 | |
| TOTAL | 114,369.4 | 100.0 | 145,324.3 | 100.0 | 146,223.0 | 100.0 | 168,468.5 | 100.0 | 168,747.5 | 100.0 | + 47.5 | |

Source: derived from Department of Statistics, 1977-1979, Various tables.

1975 data from Department of Statistics 1976b

Data suggest a massive 55 per cent increase 1975-1976 with a subsequent levelling off.⁴¹

In the Middle Ghor, the increase began in the 1976-1977 season and made steady progress thereafter to reach 82,399 dunum in 1979, some 79.2 per cent of the total cultivated area. This may reflect the recent spatial concentration of 'plasticulture' technology within the sub-districts of Deir Alla and Shuna Janobia (see below). Table 27 examines changes within the vegetable sector in some detail. Increases in area are noted throughout the sector while proportions remain relatively constant. The sector continues to be dominated by tomatoes (30.8 per cent), eggplants (16.3 per cent) and squash (14.7 per cent). However, tomatoes have been losing their dominance in relation to crops such as eggplants, squash and beans.

Spatial differences (Table 28) are again important to the analysis which follows. In particular, note the dominance of certain labour intensive crops in the Middle Ghor, while the Northern Ghor is dominated by less labour intensive crops (cabbage, cauliflower, beans and potatoes).

A less dramatic increase has been recorded with regard to fruit production; clearly there is a lag between an increase in area of fruit crops and increased production. Harvested areas of fruit crops have increased from 10.5 per cent of the total area in 1975 to 14 per cent in 1979. Fruit crops remain predominantly concentrated in the Northern Ghor, which accounts for 79 per cent of the total area.

Hazleton (1980) predicts that the increased rains⁴² of 1979-1980 will allow full irrigation of the Stage I lands during the 1980-1981 cropping season and the introduction of sprinkler irrigation throughout the Valley. This will promote a rise in cropping intensity and further moves away from field crops to more profitable vegetable and fruit production.

Table 29 indicates the planned cropping pattern as projected by the Jordan Valley Commission (1975). The land use plan reveals that the proportion of area devoted to vegetable production was to decrease from 70 per cent to 56.2 per cent, while fodder crop production was to expand from nil to some 31 per cent, of the total cultivated area. In contrast to the planned cropping pattern, there has been a considerable increase in the cultivated area devoted to vegetable production beyond the 56.2 per cent planned for 1982. Given the expanding regional market

TABLE 28 : EAST JORDAN VALLEY: VEGETABLE SECTOR CROPPED AREA
1979 BY SUB-DISTRICT (dunums)

| | Northern Ghor | | Middle Ghor | |
|---------------------------------------|---------------|------|-------------|------|
| | Area | % | Area | % |
| Tomatoes | 26,351.8 | 50.6 | 25,713.1 | 49.4 |
| Eggplants | 10,516.4 | 48.0 | 17,054.4 | 62.0 |
| Squash | 13,932.4 | 55.2 | 11,325.7 | 44.8 |
| Cucumber | 3,105.1 | 42.0 | 6,549.5 | 68.0 |
| Cauliflower and Cabbage | 7,481.7 | 93.0 | 576.1 | 7.0 |
| Beans | 10,313.6 | 62.5 | 6,189.6 | 37.5 |
| Peppers | 5,105.6 | 53.0 | 4,519.8 | 47.0 |
| Potatoes | 3,972.0 | 98.3 | 69.3 | 1.7 |
| Melon | 144.9 | 7.0 | 3,729.0 | 93.0 |
| Others | 7,162.7 | 51.7 | 6,691.6 | 48.3 |
| Total Vegetable Cropped Area | 86,348.5 | 51.2 | 82,399.0 | 48.8 |

Source: derived from Department of Statistics. Agricultural Sample Survey in the Ghors 1979. February 1980, Various tables.

for vegetable and fruit production, together with the natural advantages of the East Jordan Valley, the Government's continued neglect of the livestock sector and the need for high returns from production, the failure to meet this planned level of fodder production is hardly surprising, especially since decision-making remains with the individual landowner and tenant.

The importance of these departures from the Plan in the context of this thesis are their implications for manpower requirements. Salt and Keeley (1976) based their discussion of manpower needs on the Jordan Valley Commission plan and suggested that the cropping patterns projected for full development (Table 29) would have a negative effect on daily labour requirements (Table 14 above), reducing demand slightly from 100 in 1976 to 96.1 by 1982-1983. This results from the projected decline in the proportion of vegetable and fruit production, concomitant with the introduction of less labour-intensive fodder crops.

Whilst Salt and Keeley concluded that the combined impact of the five major variables discussed would be to increase total labour requirements substantially (from 100 in 1976 to 370.6 by 1982-1983), within this overall increase, changed cropping patterns and technological changes are shown to reduce their labour requirements.

2.5. Technological Change

Dar-al-Handasah (1977) suggest that there are '... significant opportunities for reducing labour inputs in the Jordan Valley while maintaining or increasing yields'. This forms the fifth of Salt and Keeley's factors influencing the manpower requirements of agricultural development in the Jordan Valley. The introduction of improved technology was assumed significantly to increase output per unit of labour input. However, it was recognised that any reduction in labour requirements through increased mechanization would in all probability be offset by more intensive agricultural practices and increased harvesting requirements. Thus Table 14 (line 5) indicates a 10 per cent reduction in labour demand by 1999 following the full introduction of technological developments.

Average labour inputs under the traditional surface irrigation system (dawaleeb) have been calculated (1977) to be 130 man-hours per dunum comprising 68 man-hours per dunum for cultivation/plant care and

TABLE 29 : EAST JORDAN VALLEY : PROJECTED CROPPING PATTERN 1982;
ACTUAL PATTERN 1979

| | % Cropped Area 1982 ¹ | % 1979 ² |
|---------------------|----------------------------------|---------------------|
| Tomatoes | 21.7 | |
| Eggplant | 9.7 | |
| Cabbage/Cauliflower | 5.2 | |
| Onions | 2.6 | |
| Potatoes | 3.2 | |
| Squash/Cucumber | 4.6 | |
| Beans | 7.0 | |
| Sweet Pepper | 2.2 | |
| VEGETABLES | 56.2 | 72.0 |
| Bananas | 4.8 | |
| Citrus | 9.0 | |
| FRUIT | 13.8 | 14.0 |
| Wheat and Barley | 7.7 | 18.8 |
| Maize | 11.5 | |
| CEREALS | 18.8 | |
| Alfalfa | 13.2 | |
| Berseem | 8.2 | |
| Fodder Maize | 8.8 | |
| FODDER | 30.8 | |

Source: 1. Jordan Valley Commission, 1975, A19, table 7

2. derived from Department of Statistics, The Agricultural Sample Survey in the Ghors 1979, Various tables, February 1980.

reduction in labour input:

- (i) the delayed introduction of sprinkler irrigation because of limited water availability following five years of drought.⁴³
- (ii) the limited success of the land reform programme in the northern Valley. Over much of the southern Valley the programme is still pending or has not been implemented. Thus there remain many holdings of uneconomic size for mechanization and lacking the capital for its introduction.
- (iii) several of the measures projected in the Jordan Valley Development Plan have yet to show their impact on improving conditions and productivity. As yet, farm machinery is not available on a co-operative basis as planned.

Given the expansion in irrigated area, cropping intensity and the continued predominance of labour intensive vegetable crops, these additional factors (i-iii) have necessarily meant increased labour demand. The most significant factor of increasing importance has been

- (iv) the rapid expansion in 'plastic agriculture', that is the cultivation of vegetables (predominantly cucumber and tomatoes) under plastic tunnels and houses. These have increased dramatically in area since their introduction in 1975. In 1977 plastic covers comprised

-51-

of plastic tunnels (6015 dunum) 99.6 per cent were found in this area. Steitiah (1980) predicts that, if the current market and price conditions for these crops continue, areas planted under plastic covers with drip irrigation are likely to increase dramatically over the next few years.

In conclusion it appears that, rather than decreasing labour requirements (however slightly), changes in technology, in particular the increasing utilisation of plastic covers and drip irrigation, have

reduced labour inputs. Given the size of returns to this

NOTES

1. Barka and Harza Engineering Co. Ltd., 1955
2. For a discussion of the war of attrition in the Jordan Rift see Harris, 1978
3. Jordan Valley Commission, 1972
4. Jordan Valley Commission, 1975
5. Mazur, 1979, 182
6. Department of Statistics, 1980c
7. Jordan Valley Commission, 1975, A.13
8. See Dar-al-Handasah/Harza, 1977
9. Graham-Brown, 1980b, 3. The Maqarin Dam is now to provide 100 mill cu m per annum of industrial and domestic water to Amman plus 26 mill cu m per annum to Irbid. This re-allocation will reduce water supply for irrigation and hence the target area from 360,000 dunum to 300-310,000 dunum.
10. The term 'farm worker' refers to all labour on each agricultural holding. Since many work on several holdings, some degree of double counting is contained within this figure. This explains the substantial difference between the figure of 28,967 quoted for 1973 farm workers by the Department of Statistics. (1973) and the figure of 15,734 for the agricultural 'labour force'. The latter is confined to those individuals living and working in the Valley whose main activity is agriculture, hence there is no double counting. The 184 per cent increase in labour requirements thus represents an increase in labour force from 15,734 to 44,700 Salt and Keeley, 1976, 202, Appendix Table 22 implies that the increase in farm workers on irrigated land alone is from 20,279 in 1973 to 63,731 assuming no change in other variables
11. Salt and Keeley, 1976, 85
12. National Planning Council, 1976b, 92
13. Jordan Valley Commission, 1975, C2-C5
14. Department of Statistics, 1973, Tables 39-42
15. The northern and middle sub-areas of the 1973 survey are assumed to be more representative of future ratios than the southern area.
16. Salt and Keeley, 1976, 81
17. Department of Statistics, 1973 defines agricultural holdings as '... the area of agricultural land managed as one economic unit by one person or more. The number of parcels of the holding has no effect on the definition if they are located in the same agricultural area'. (i.e. within the same sub-region of the East Jordan Valley)
18. Hazleton, 1980

19. Department of Statistics, 1977, and 1980a; Mazur, 1979, 194 note 23 states : 'The 1975 Census was the result of an extensive data gathering effort, which the J.D.S. believes to have recorded nearly all agricultural holdings. Several checks were made on farmers' estimates of holding size, including direct measurement of a random sample of holdings'. It must be pointed out however that the data derived from the 1978 Agricultural Census are (i) from unpublished preliminary results and (ii) hand tabulated from computer printouts by the author. Note also that the size classifications used in the 1978 Agricultural Census differ from those in other sources: less than 5; 5-10; 10-15; 15-20; 20-40; 40-100; 100-200 and 200+ dunum. Evidence from the Jordan Valley Development Plan is rejected since this records no agricultural holdings in the range 101-200 dunum. In contrast, Department of Statistics, 1973, records 219 and the 1978 Census results indicate 155 in this range. Unfortunately, the results of the 1975 Agricultural Census in the Ghors do not include data on the size distribution of agricultural holdings. Mazur, 152, Table VII.2 provides the size distribution for the whole East Bank derived from the preliminary unpublished results of the 1975 census.
20. For details see Jordan Valley Commission, 1975, 43-49, 'Farm Business Analysis'. USAID/University of Jordan, 1980, 25 comments on the size of agricultural holdings in the East Jordan Valley to the effect that, with a median size of 28 dunum, the area of holdings in the Valley may seem small. However, a holding of this size under high yielding techniques producing tomatoes can constitute a larger business than a 40 dunum holding cultivating wheat with traditional practices. They suggest that, because of wide variations in cost and return (estimated range from \$ 1,800 - \$ 30,000) even on farms varying by only 10 dunum, the convention of using land area to represent the 'small farmer' is highly misleading.
21. Firky, 1979, 13
22. Aresvik, 1976, 255. The 1963 Land Reform Laws limiting the minimum size of holdings on productive lands to 30 dunum and on marginal lands to 50 dunum was based on the recommendations of the International Bank for Reconstruction and Development, 1961, which also suggested that the regulation of holdings to 20-100 dunum would increase the number of farmers in the East Jordan Valley from 3,825 to 15,825.
23. Dar-al-Handasah/NEDCO, 1969, Vol. IV, Appendix K, 92 : '... in almost all matters left to the discretion of the various committees as well as to the discretion of the Authority, the tendency has been towards leniency than towards a strict interpretation of the provisions of the law ...' See also Hazleton, 1974, 35
24. See Dar-al-Handasah/NEDCO, 1969, for details of all the land reform laws
25. Dar-al-Handasah/NEDCO, 1969, 21

26. See Firky, 1979, 17. Article 24, Law 18, 1977 alters the priority for land redistribution to:-
 - (i) Holders leasing or sharecropping land.
 - (ii) Professional farmers residing in the Jordan Valley.
 - (iii) Professional farmers not residing in the Jordan Valley.
 - (iv) Holders outside the Kingdom.
27. For a discussion of the pre-1973 period, see Department of Statistics, 1961; also Hazleton, 1974
28. See Dar-al-Handasah/HARZA, 1978, Vol. IV, Appendix C, 27
29. Sharab, 1975, Table II - 1
30. See Barhoum, 1976, 30. Barhoum notes five different bases for sharecropping: (i) 50:50 system; (ii) 67 per cent system; (iii) 60 per cent system; (iv) 33 per cent system and (v) 25 per cent system. See also Issi, 1975, 9. The 1977 law amendment (see Firky, 1979) introduced a legal minimum lease of three years, but the extent to which this has been implemented remains unknown
31. See Jordan Valley Authority's objections in favour of sharecropping at JVA Donor's Meeting Report, April 1978, quoted in Firky, 1979, 18
32. Firky, 1979, 29
33. See USAID/University of Jordan, 1980, 34, on the new 'breed' of professional farmers and managers.
34. The term 'cropping intensity' used in this context refers to the margin between the area harvested and the area cultivated.
35. Ignoring data for 1978, which are regarded with suspicion. See note 41. Since 1979, the Government has been promoting tomato production by offering a minimum price of JD 50 per ton. See USAID/University of Jordan, 1980, 30. Prices for other fruit and vegetables are set by the Ministry of Supply, who establish a maximum level for consumer prices without specifying minimum farmgate prices.
36. USAID/University of Jordan, 1980
37. Steitieh et. al 1978b
38. See Steitieh, 1980
39. Mazur, 1979, 183
40. USAID/University of Jordan, 1980, 26. The Five Year Plan 1976-1980 (pp.110-114) calls for increased livestock production to reduce dependence on imports of livestock. Increased production was to be based on an expansion of fodder production from several irrigation projects (Tell Burma; Wadi Abyad; Arja-Oweini; Dissi; Jordan Valley). The NPC expected the Jordan Valley to produce 38,000 tons of clover from 30,000 dunum by 1980 together with 16,000 tons of maize from 40,000 dunum. But, as Mazur, 1979, 145 concludes, 'significant progress in non-poultry livestock production in the dryland areas appears to require the adoption of a particularly demanding package of practices, including breed improvement, better disease control and a combination of measures that together would constitute a

revolution in land-use practices¹. Recent detailed analysis (see Gunn Rural Management Limited, 1978, Vol. 2, Chapter 4, 213-256. 'Jordan Valley Fodder Production Sub-Project' suggests that there is a specific economic disincentive to proceeding with the production of alfalfa on the basis that it represents a '... sub-optimal allocation of resources...' USAID/University of Jordan, 1980, 19 : 'It appears that the current pattern of livestock production derived from the pastoral nomadic heritage is not one on which it is possible to build a future more efficient livestock production sector¹.

41. Regarding the 1978 Sample Survey data, USAID/University of Jordan, 1980, 26, comments that '... across the board sharp increases in yields in 1978 for crops grown in the Jordan Valley do not, to our knowledge, reflect either changes in weather or widespread changes in cultivation practices. We cannot explain this apparent upsurge and therefore suggest that it not be viewed as a trend until further data are in'. Similarly, the increase in cropped area in the Northern Ghor appears to be without foundation. The addition data referring to 1979 imply over-estimation for 1978.
42. MEED, 1979e
43. Keller, 1977, 7-9 questions the viability of introducing sprinkler irrigation to the Valley.
44. Steitieh, et al 1978a

TABLE 31 : JORDAN VALLEY POPULATION PROJECTIONS

| | Existing Population | Attracted Population | Optimum Population |
|------|---------------------|----------------------|--------------------|
| 1975 | 67,920 | 0 | 67,920 |
| 1976 | 69,957 | 8000 | 69,957 |
| 1977 | 72,056 | 8000 | 80,055 |
| 1978 | 74,218 | 8000 | 90,457 |
| 1979 | 76,444 | 8000 | 101,171 |
| 1980 | 78,737 | 8000 | 112,206 |
| 1981 | 81,099 | 8000 | 123,572 |

Source: derived from Jordan Valley Commission, 1975, C4 Table 10.

PART THREE: POPULATION, MIGRATION AND SECONDARY LABOUR MARKET DEVELOPMENT IN THE EAST JORDAN VALLEY

Part Three examines population growth and patterns of migration in the East Jordan Valley, making use of the most recent census material in detailing the characteristics and implications of the secondary labour market evolution.

3.1. Population and Employment Dynamics

The 1975-1982 Development Plan¹ called for a doubling of the East Jordan Valley's population to 123,572 by 1981 (Table 31) and suggested that over 75 per cent of this growth would be from induced in-migration at an annual average rate of 8,000. This additional manpower was required for optimal exploitation of the newly-irrigated lands. The Jordan Valley Commission proposed two incentives to attract the necessary population:

- (i) relatively high income opportunities following the redistribution of irrigated lands,
- (ii) an improved living environment through the provision of housing and social services.²

The plan proposed a redistribution of the growing population into 36 population centres (retaining 31 of the existing centres and creating 5 new settlements), in a three-category service hierarchy based on population size (Fig. 2)

The housing programme aimed to assist all families residing in the Jordan Valley and especially low-income families. A system of priorities was established for the distribution of housing provisions:

- (i) First priority to the newly attracted families as an incentive to move and settle in the Valley in new population centres;
- (ii) to the young working population in the Valley as an incentive to stay and become established;
- (iii) to families living in tents and huts;
- (iv) to families in mud houses.

The programme aimed to produce some 3,000 new housing units each year.

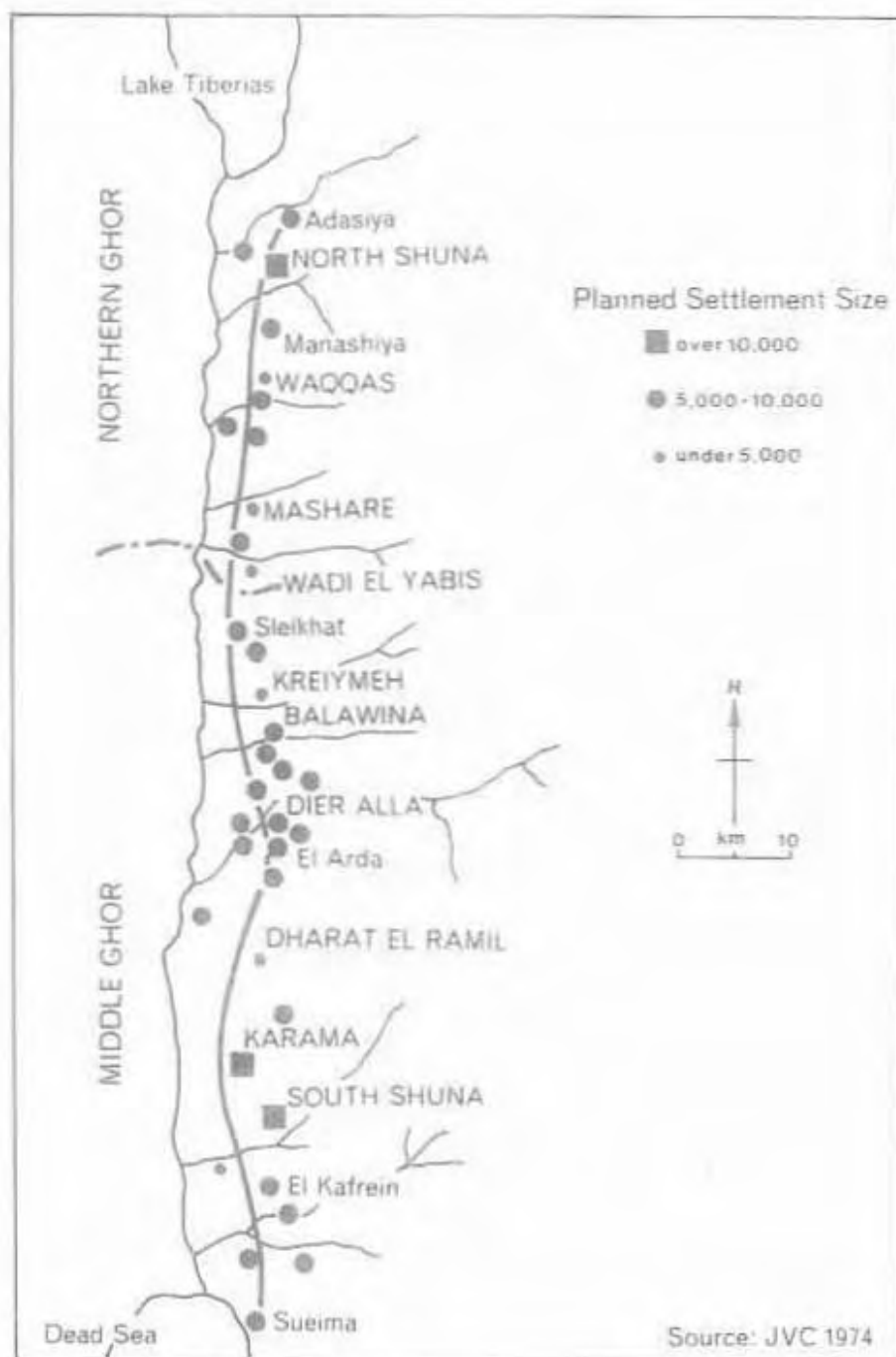


Figure 2. East Jordan Valley: planned settlement size

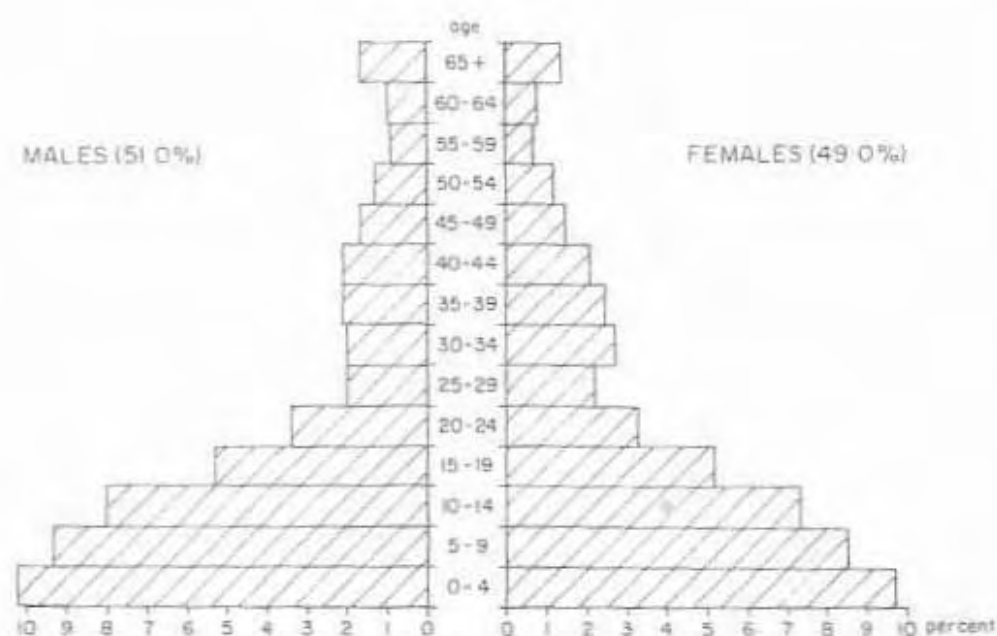


Figure 3. Age and sex structure of the Jordanian population, Agwar Shamalya sub-district, 1978

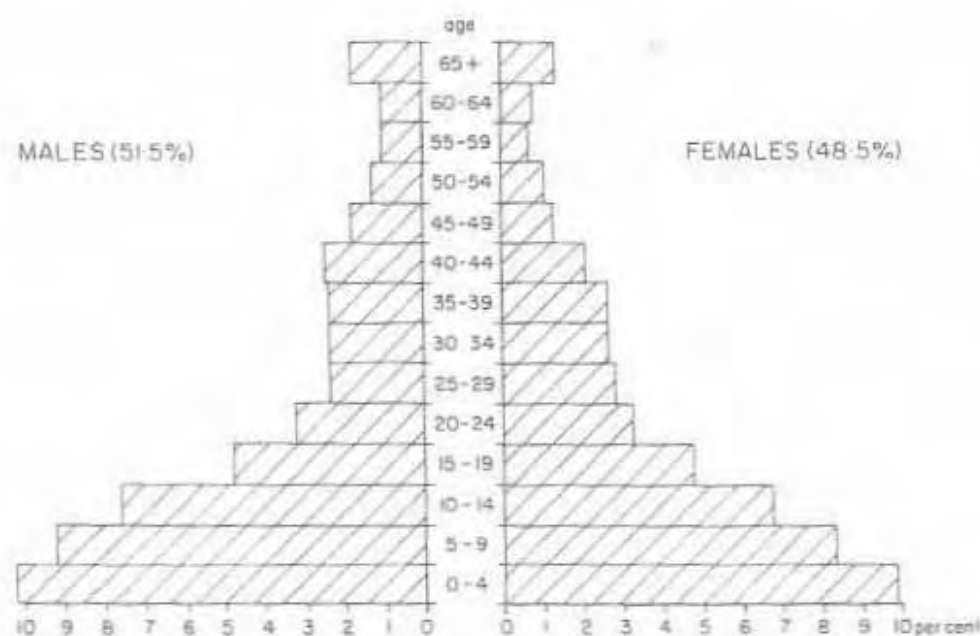


Figure 4. Age and sex structure of the Jordanian population, Dier Alla and Shuna Janobia sub-districts, 1978

Mazur recognised that the aim of attracting such a large in-migration flow was '... the most serious challenge to the success of the plan ...' and a highly optimistic aim, given that much of the planned irrigation and redistribution would not take place until 1982 even if the plan was completed on schedule.³ Despite this, the Jordan Valley Authority claims a great deal of success, suggesting that the 1978-1979 population growth, seen in the census data, represents substantial in-migration.⁴ Total population according to these two censuses has increased from 76,677 in 1978 to 86,662 in 1979. Of this 13 per cent increase (9,985) an estimated 7,400 were believed to be recent Jordanian in-migrants.

The following section analyses the available data in greater depth and seeks to refute this suggestion, concluding that the Jordanian population of the East Jordan Valley is in all probability stagnant and may even be declining in certain areas. Figures 3 and 4 show age/sex pyramids for the Jordanian population, indicating a deficit of males aged 25-40, contrary to what one would logically expect if the area was receiving settlers.

Population growth during the 1960s was encouraged by anti-malarial campaigns and the gradual provision of irrigation water following the completion of the East Ghor Main Canal.⁵

The restoration of peace in 1971 led to repopulation and a gradual replacement of the irrigation system. In 1973, the Department of Statistics enumerated a total population of 64,012. Throughout the 1970s, population growth continued with expanding irrigation and employment opportunities. The 1978 Pre-Census Test⁶ indicates a total Valley population of 76,677. This represents an annual increase over 1973 of 3.6 per cent, only marginally higher than natural increase and therefore indicating little net migration. In contrast, the 1979 Census⁷ enumerated a population of 86,662, representing an annual average population increase of 5.2 per cent since 1973 and implying substantial in-migration. Moreover it implies a population growth of 13 per cent from 1978 to 1979. Such a rapid acceleration in growth rates must be considered unlikely. Spatial disaggregation of available data (Table 32) adds to this confusion.

An examination of Table 32(a) suggests that growth during 1973-1978 was predominantly in the northern half of the Valley (24.8 per cent) and the south (35.9 per cent) rather than the middle (8 per cent). In contrast, Table 32(b) provides disaggregated data for 1978-1979 and demonstrates

TABLE 32 : EAST JORDAN VALLEY: PATTERNS OF POPULATION GROWTH
1973-1978 and 1978-1979

(a) 1973-1978

| Sub Area | North | Middle | South | Total |
|-------------------|--------|--------|--------|--------|
| 1973 ¹ | 28,062 | 25,795 | 10,155 | 64,012 |
| 1978 ² | 35,014 | 27,863 | 13,800 | 76,677 |
| Increase | 6,952 | 2,068 | 3,645 | 12,665 |
| % Increase | 24.8 | 8.0 | 35.9 | 19.8 |

(b) 1978-1979

| Sub Area | Irbid | Deir Alla | Shuna Janobia | Total |
|-------------------|--------|-----------|---------------|--------|
| 1978 | 43,448 | 16,680 | 16,549 | 76,677 |
| 1979 ³ | 46,397 | 22,074 | 18,191 | 86,662 |
| Increase | 2,949 | 5,394 | 1,642 | 9,985 |
| % Increase | 6.8 | 32.3 | 9.9 | 13.0 |

Source: 1. Department of Statistics, 1973, 122-127.

2. Department of Statistics, 1978

3. Department of Statistics, 1979a

Districts are based on Rhoda, 1980, village groupings.

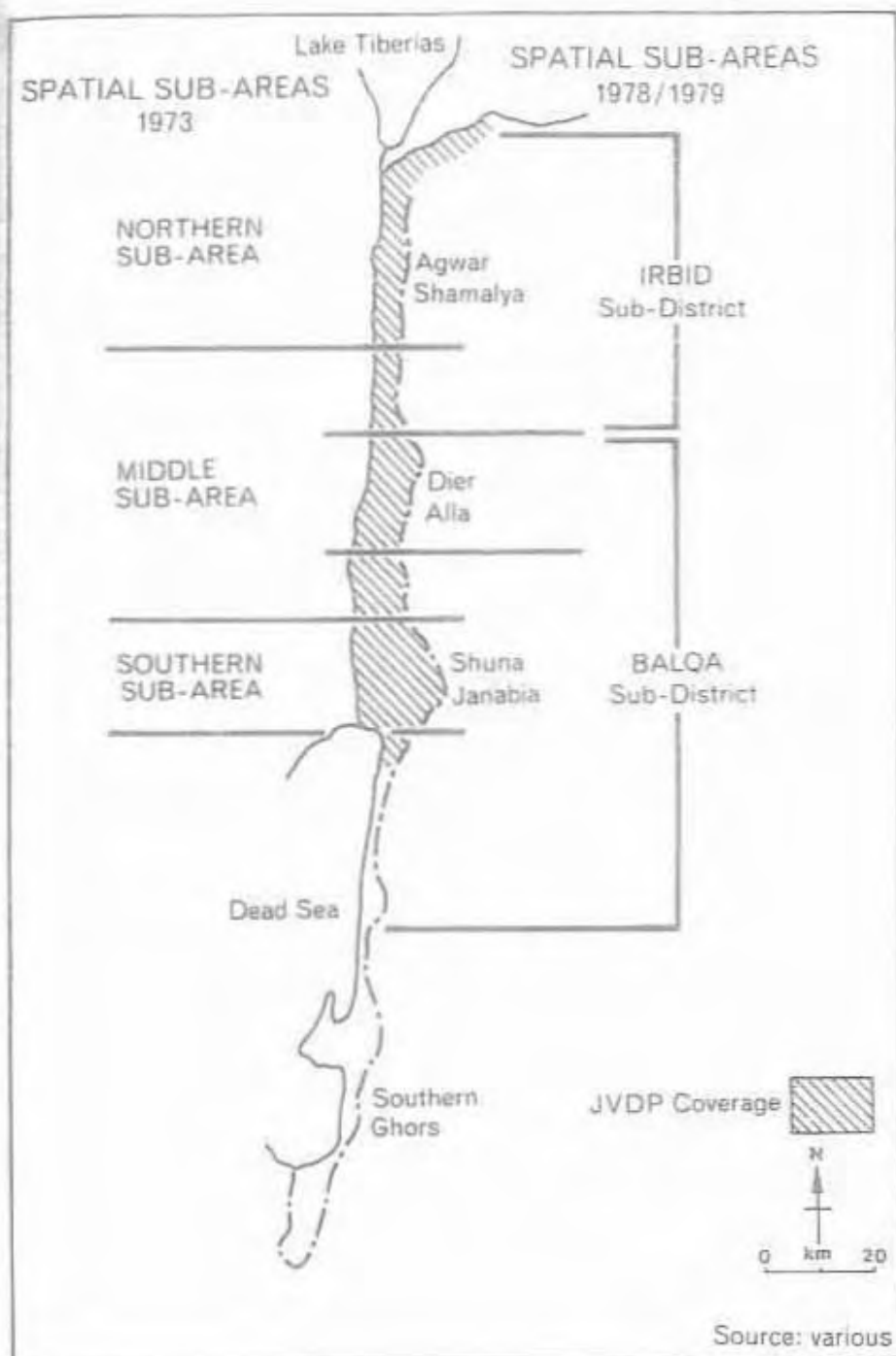


Figure 5. Census districts, 1973 and 1978/79

a contrary pattern, with growth in the Deir Alla area (middle) at 32.3 per cent while Irbid (6.8 per cent) and Shuna Janobia (9.9 per cent) registered much smaller increases. The spatial units used for enumeration make the identification of specific growth patterns particularly difficult. Figure 5 shows the varying spatial sub-areas used for enumeration in 1973 and 1978.

Comparison of individual village growth rates is virtually impossible since a different set of villages is listed in each census. As the Department of Statistics recorded in 1973, 'a common characteristic of population settlements in the Valley is the existence of numerous names for the same locality or of its quarters ... one of the difficulties in identifying the population localities is the absence of known village or settlement geographical limits'.⁸ Whilst the volume of growth at Deir Alla seems implausible, the fact that growth was concentrated in this area seems likely since Deir Alla has been the central region for adoption of 'plasticulture' and is currently the main marketing area for the Middle and Southern portions of the Valley because of its access to Amman.

Rhoda⁹ proffers a unique solution to the problem of discerning the spatial pattern of population growth by grouping villages from the three censuses into six main areas:

1. North Shuna - Manshiya
2. Mashare - Waqqas
3. Wadi el Yabis - Sleikhat
4. Kreiymeh - Balawina
5. Deir Alla - el Arda - Damiya
6. Karama - South Shuna - el Rawda

Table 33 presents the results of analysis on this basis. Growth rates here are much more realistic. Deir Alla still appears to predominate with an average annual 1973-79 growth rate of 8.3 per cent. Rapid growth and implied in-migration are also recognised in the Mashare - Waqqas (6.2 per cent) and Karama - South Shuna - El Rawda (6.1 per cent) groups. However, net out-migration is identified from Kreiymeh - Balawina (0.7 per cent growth) and Wadi El Yabis - Sleikhat (1 per cent growth).

This still does not explain the disparity between the 1978 and 1979 Census results showing a growth of 9,985 and the 1973-1978 growth of only 12,665 (that is 79 per cent of total growth 1973-1979 occurring in the 1978-79 period). This acceleration in 1978-79 is misleading and, it can be suggested, arises from an under-enumeration of non-Jordanians

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TABLE 33 : EAST JORDAN VALLEY: POPULATION GROWTH IN THE PERIOD
1973-1979

| Village Group | Population | | | Annual % Increase | | |
|--------------------------------|------------|--------|--------|-------------------|---------|---------|
| | 1973 | 1978 | 1979 | 1973-78 | 1978-79 | 1973-79 |
| North Shuna - Manshiya | 12,332 | 13,580 | 15,824 | 1.9 | 17 | 4.2 |
| Mashare - Waqqa | 11,972 | 15,434 | 17,305 | 5.2 | 12 | 6.2 |
| Wadi El Yabis - Sleikhat | 4,744 | 4,930 | 5,050 | 0.8 | 2 | 1.0 |
| Kreiyneh - Balawine | 9,675 | 9,504 | 10,084 | -0.4 | 6 | 0.7 |
| Deir Alla - Damiya | 12,559 | 16,680 | 20,209 | 6.0 | 21 | 8.3 |
| Karama - South Shuna | 12,730 | 16,549 | 18,190 | 5.4 | 10 | 6.1 |
| TOTAL | 64,012 | 76,677 | 86,662 | 3.6 | 13 | 5.2 |

Source: derived from Rhoda 1980, 10, Table II.1
Department of Statistics, 1973, 122-127
Department of Statistics, 1978
Department of Statistics 1979a

in the 1978 Pre-Census Test, (Table 34).

The recorded Egyptian population in the East Jordan Valley in 1978 was 628, which would hardly warrant Steitieh's comment on the '... critical importance of Egyptian labour ...'. Steitieh records 457 non-Jordanians working on farm units using plasticulture (206 holdings) and that 90 per cent i.e. 411 (Table 35) are Egyptian.¹⁰ (This level of 'permanent' non-Jordanian labour in 'plasticulture' increased in the 1979/80 season to 963 (in a total of 993) with 870 Egyptians.)¹¹ Given that plastic covers only accounted for a total cultivated area of 6,756.3 dunum (Table 30) implies that many more Egyptians were engaged in the East Jordan Valley's total cultivated area of 234,394.4 dunum (Table 21e).

Available evidence points to a more rapid population growth in the southern half of the East Jordan Valley (Table 33), which is also the greatest area of plasticulture adoption (Tables 35 and 30) and of secondary labour migrants. In the 1978 census, 65.4 per cent of non-Jordanians were recorded in the Deir Alla and Shuna Janobia districts (Table 36a). Rhoda suggests that construction data confirm this trend for growth to be concentrated in the south. The 1978 census shows that in the Deir Alla area some 31.4 per cent of housing units were built in 1973-1978 compared with 16.3 per cent in Irbid. Furthermore, 17.2 per cent in Deir Alla were built in the post-1976 period while the corresponding figure for Irbid is only 8 per cent.

The question now arises, why did the 1978 census under-estimate the non-Jordanian population? A variety of reasons can be proposed:

- (i) the Pre-Census Test did not use trained enumerators;
- (ii) the census was carried out on a household basis whereas the non-Jordanian and particularly the Egyptian population characteristically live in 'informal' households and housing;
- (iii) the census in November 1978 followed the Arab summit's condemnation of the Camp David Agreement and Egypt's role in the peace process.

Deliberate evasion and the provision of false returns could be a further factor in their under-enumeration. A number of sources intimated that employers feared their Egyptian labour would be expelled.

In these circumstances, what was the real level of non-Jordanians

TABLE 34 : JORDAN VALLEY: NON-JORDANIAN POPULATION BY NATIONALITY,
NOVEMBER 1978

| | Number | % |
|---------------|--------|-------|
| South Korean | 851 | 37.4 |
| Egyptian | 628 | 27.6 |
| Pakistani | 324 | 14.2 |
| Indian | 289 | 12.7 |
| Syrian | 29 | 1.2 |
| Saudi Arabian | 15 | 0.7 |
| Lebanese | 11 | 0.5 |
| USA | 11 | 0.5 |
| Others | 117 | 5.1 |
| TOTAL | 2,275 | 100.0 |

Source: derived from Department of Statistics, 1978

Unpublished preliminary results provided by the Jordan Valley
Authority, hand-tabulated by the author from computer print-
outs. (March 1980, Amman)

living and working in the East Jordan Valley in 1978? Assuming that the 1979 Census was more thorough and accurate, as seems reasonable, then the growth rate of 5.2 per cent per annum 1973-1979 is likely to be relatively accurate and applicable to the 1979 population. Given a growth rate of 5.2 per cent per annum since 1973, the 1978 population would have been 82,652. This compares with an actual census figure of 76,677 which, the discussion implies, is an accurate enumeration of Jordanians but an under-enumeration of non-Jordanians. It can be speculated that the deficit between these two figures of 5,975 represents the unrecorded non-Jordanian population. Adding this to the 2,264 recorded in the 1978 total of 76,677, we arrive at a non-Jordanian population in 1978 of 8,239.

The 1978 Pre-Census Test (Table 48) records that 79 per cent of the non-Jordanian population were actively employed. There is no reason to assume that the larger estimate would have a lower participation rate. On this basis, the revised non-Jordanian population of 8,239 represents an active population of 6,509 compared to a Jordanian working population of 13,522. Combining these two suggests a total employed population of 20,031 in 1978.

As a corollary to this, the recorded active population in 1978 of 15,310 appears far too small when compared to that of 13,475 for 1973. Crude participation rates are 19.9 per cent and 30.5 per cent respectively (population over 15). Rhoda suggests that, with a population of 76,677, the labour force should have been approximately 23,000, assuming a constant participation rate of 30 per cent. However (i) the input of replacement migrants, largely unaccompanied males, will have acted to increase the participation rate; (ii) a breakdown of the 1978 labour force data (Table 37) shows a female employment level which seems far too low. In 1978 there were 13,080 males and 442 Jordanian females in active employment. This compares with the 1973 survey's figure of 14,014 males and 5,481 females (over 15). Assuming a constant ratio of male to female employment would increase the female labour force to 5,200 and hence total labour force (Jordanian and non-Jordanian, revised) to 24,800. Note that a 30 per cent participation rate with the revised population total for 1978 would produce an actively employed population of 24,796.

Given a 1978 population of 82,652, the population increase of 4.8 per cent (4,010) to 1979 (86,662) does not support the Jordan Valley Authority's belief that substantial in-migration occurred. With a

TABLE 35 : EAST JORDAN VALLEY 1978-1979: DISTRIBUTION OF PERMANENT LABOUR (JORDANIAN AND NON-JORDANIAN) WORKING UNDER DIFFERENT FARMING SYSTEMS WITH DRIP IRRIGATION, BY TENANCY STATUS AND LOCATION

| Region | Plastic Houses Jord. Non-Jord. | Plastic Tunnels Jord. Non-Jord. | Fruit Trees Jord. Non-Jord. | Plastic Houses Jord. Non-Jord. | Plastic Tunnels Jord. Non-Jord. | Fruit Trees Jord. Non-Jord. |
|--------------------|-----------------------------------|------------------------------------|--------------------------------|-----------------------------------|------------------------------------|--------------------------------|
| (a) Owner Operator | | | | | | |
| North | 3 | 6 | - | - | 11 | - |
| Middle | 3 | 67 | - | 2 | 10 | - |
| South | 2 | 7 | - | - | - | - |
| TOTAL | 8 | 80 | - | 2 | 21 | - |
| (b) Cash Renter | | | | | | |
| North | - | - | - | - | - | - |
| Middle | - | 2 | 4 | - | - | - |
| South | - | 8 | 8 | - | 2 | - |
| TOTAL | - | 10 | 12 | 2 | 2 | - |
| (c) Sharecropper | | | | | | |
| North | - | 1 | - | - | - | 23 |
| Middle | - | 9 | - | - | 5 | 101 |
| South | - | 2 | 15 | 3 | 35 | 333 |
| TOTAL | - | 12 | 15 | 3 | 35 | 457 |
| | | | | Total | | |
| | | | | Open Farming Jord. Non-Jord. | Jord. Non-Jord. | Jord. Non-Jord. |
| | | | | 3 | 35 | 46 |
| | | | | 457 | | |

Source: Steitleh, and Musa, 1980, 29, Table 7

natural increase of 3.5 per cent, in-migration represents only 1,117, which the author's hypothesis would suggest comprises mainly non-Jordanian migrants. The 1979/1980 level of replacement migrant population is thus estimated at between 9,000 and 15,000.

The preliminary data available from the 1979 Census do not include a breakdown on the basis of nationality with which to check these speculations. In conclusion, the replacement migrants represent some 10-17 per cent of the total Valley population and up to 34 per cent of the labour force in early 1980.

Comparing the 1973 and 1978 censuses, one can demonstrate a decline in the number of Jordanians employed in agriculture in the East Jordan Valley. The 1978 Census shows 13,522 Jordanians in active employment, of whom 7,114 are employees. Total non-agricultural sector employment was 5,700, of whom an estimated 85 per cent (4,800) are Jordanians. This leaves approximately 2,300 Jordanians employed in agriculture (7,100 minus 4,800). Rhoda suggests a subsequent decline to 1-2,000 by 1980, though the absolute figures should be higher given the under-enumeration of females in active employment. Rhoda's assumption of a decline of Jordanians in agricultural employment is ambiguous in the light of his earlier statement that 'wages have increased and, in response agricultural labour, both Jordanian and non-Jordanian, has moved into the Valley'.¹² The data presented above have demonstrated that this in-migration is primarily of non-Jordanian labour.

Supporting evidence for a fall in the Jordanian component of the agricultural labour force can be taken from the Pre-Census Test 1978. If one accepts the 1978 data for Jordanians as correct, this indicates a fall in the proportion employed in agriculture from 76 per cent of total employed males in 1973 (10,282) to 63 per cent (9,784) in 1978 (Table 38). This is consistent with Dar-al-Handasah's statement that 'there are significant opportunities for reducing labour inputs in the Jordan Valley while maintaining or increasing yields',¹³ (Table 39) but is inconsistent with the analysis presented above. On the basis of the revised 1978 population, the agricultural employment of 9,784 is increased by a non-Jordanian population employed in agriculture of approximately 5,200 (some 80 per cent of the total active non-Jordanians). This gives a revised active employment in agriculture of 14,984, which represents 76 per cent of the total labour force (that is of the revised total of 19,761).

Despite the reservations discussed above concerning the available data relating to non-Jordanians, this is the only source available (1978) and so must be examined in greater detail. Furthermore, whilst the author disputes the absolute number of non-Jordanians enumerated, the characteristics revealed seem plausible, suggesting there has been no predetermined bias in the enumeration.

Figures 6 and 7 present age/sex pyramids relating to non-Jordanians in Irbid and Balqa sub-districts. Overall, only 10 per cent of non-Jordanians were females and only 10.3 per cent under the age of 15. However, significant differences appear when the data are presented in a spatially disaggregated form (Table 3b a and b). The non-Jordanian population of Irbid sub-district has a lower proportion of females (6.5 per cent) and only 6.4 per cent of the population are under 15. In contrast, Balqa has a relatively high female population (12.1 per cent) and a more youthful structure (12.3 per cent under 15). This relates

3.2. Secondary Labour Migrants

This increase in agricultural employment is consistent with the trends analysed above; furthermore the fact that the increase relates to a growth in non-Jordanians supports the theory of a decline in Jordanian agricultural labour (not Jordanian sharecropping). The latter is paralleled by national trends, Kitman notes a fall in agricultural employment from 115,000 in 1970 to 75,000 in 1975 and suggests this decline has accelerated over the 1975-1980 period. Although available statistics do not allow a disaggregation of employment data by sub-area, the hypothesis that in-migration of replacement labour has been concentrated in the south and middle areas is borne out. Of the recorded non-Jordanian population in 1978, the available data indicate that the largest groups were in the major population centres in the south: Shunna Janobia : 615 non-Jordanians; El Arda : 365 non-Jordanians; South Shunna : 82 non-Jordanians. In the Northern Ghor, only Waqas (261) and Buseila (198) had substantial numbers of non-Jordanians.

It appears that the Pre-Census Test merely enumerated those non-Jordanians in the main population centres, only eighteen settlements having a recorded non-Jordanian population of more than twenty individuals.

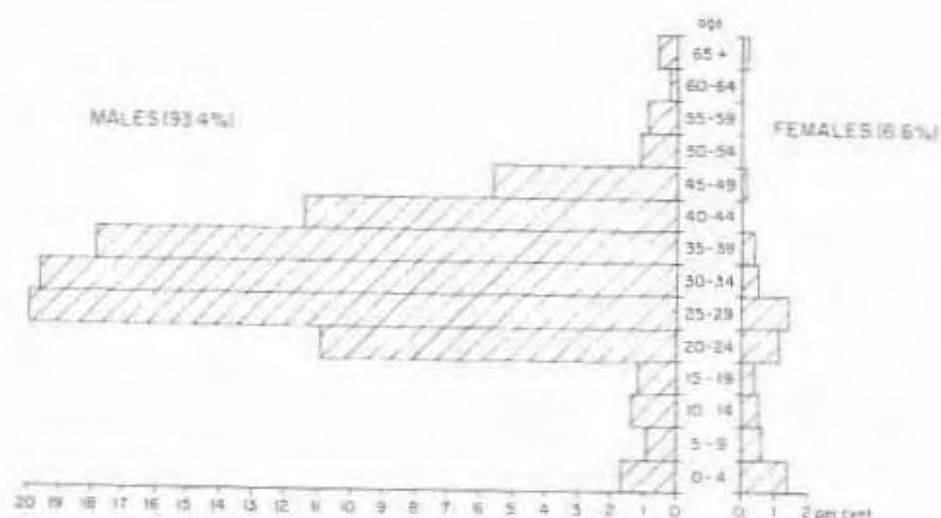


Figure 6. Age and sex structure of the non-Jordanian population, Agwar Shamalya sub-district, 1978

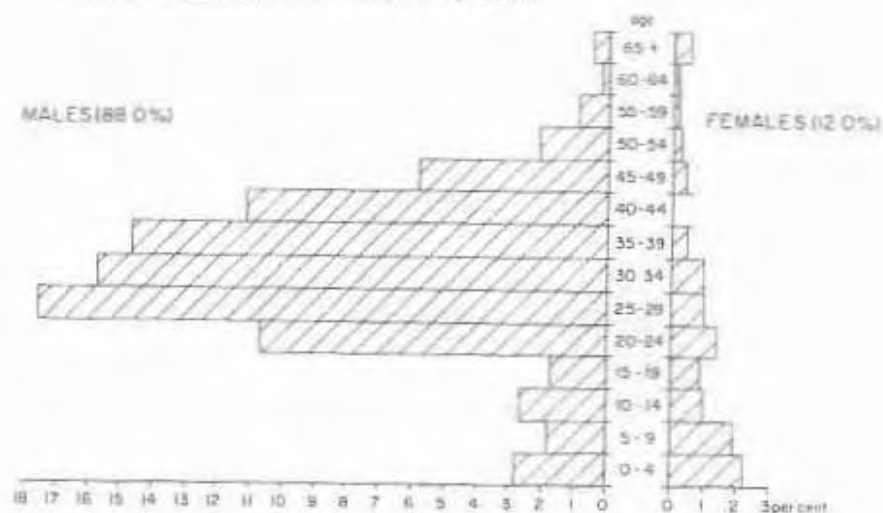


Figure 7. Age and sex structure of the non-Jordanian population, Deir Alia and Shuna Janobia sub-districts, 1978

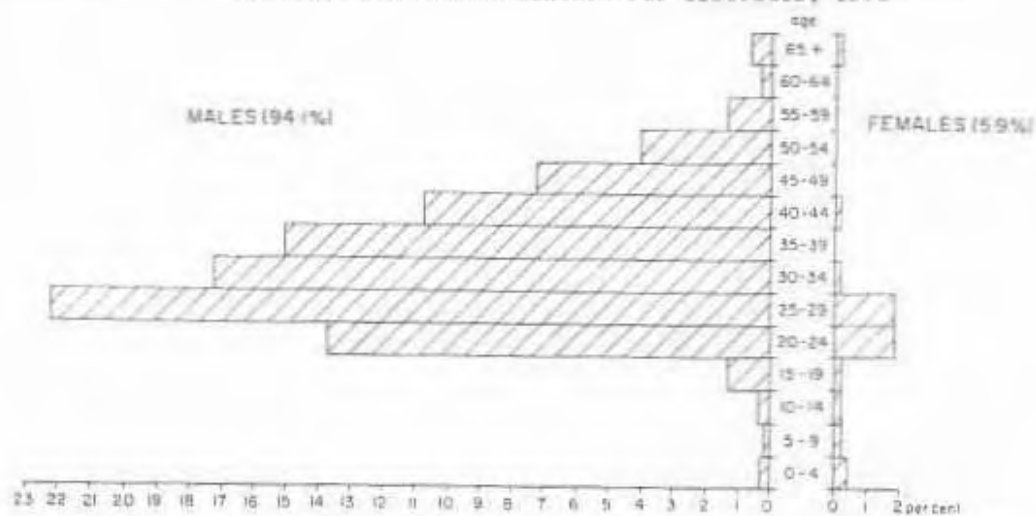


Figure 8. Age and sex structure of the Egyptian population of the East Jordan Valley, 1978

almost certainly to the distribution of Pakistani migrants.

The Egyptian pyramid (Figure 8) represents a 'classical' migrant labour community, with 94 per cent male and only 2 per cent under the age of 15 (Table 40). In contrast, the Pakistani community represents a more mature population with 40.1 per cent female and 48.8 per cent under the age of 15. Casual observation supports this finding; small communities of Pakistanis can be found distributed throughout the southern half of the Valley. The distribution of the Pakistani population is a reflection of the employment opportunities available, some 98 per cent being in Balqa. Overall, only 34.8 per cent of the main migrant groups were in the Irbid area (Table 41), which relates to the fact that the proportion of rented holdings remains high in the southern areas (63 per cent) in comparison with the Northern Ghor where land reform has approached completion and a greater proportion of family labour is employed.

Egyptian migrants form 27.5 per cent of the total non-Jordanian population according to 1978 Census figures. The distribution reflects the evidence cited above; 68 per cent of Egyptians were found in Balqa sub-district, that is in the areas of sharecropping and introduction of plasticulture. Census results show the largest non-Jordanian population to be South Koreans (851) with 37 per cent of the total. This is likely to be an accurate figure since these are contract labourers working for South Korean firms contracted by the NVA for building projects.

The Indian population of 289 can be considered as secondary migrants in the same sense as the Egyptians, with 288 males and less than 1 per cent under 15.

From the available data we can thus dispel the notion that all non-Jordanians in the East Jordan Valley are secondary labour migrants in the terms established, i.e. short stay, unaccompanied and highly mobile within the area. Data from the 1978 Census identify only the Egyptian and Indian populations as having such characteristics. Discussion and concern have focused on the Egyptians as the most important source of 'temporary' migrant agricultural labour.

Selective field observations and spontaneous interviews with Egyptian migrants in the Deir Alla area enable the author to suggest that secondary migration to the area is essentially short term, the majority of migrants having expressed their intention of leaving within a year of arrival. A high proportion of Egyptians originated from the 'urban poor'

TABLE 36 (a) : JORDAN VALLEY, NON-JORDANIANS BY AGE, SEX AND SUB-DISTRICT, 1978

| District Age Group | Irbid | | | Balqa | | | Total Valley | |
|-----------------------|-------|--------|-------|-------|-------|--------|--------------|-------|
| | Male | Female | Total | % | Male | Female | Total | % |
| 0 | 2 | 2 | 4 | 0.5 | 9 | 3 | 12 | 0.8 |
| 1-4 | 12 | 9 | 21 | 2.6 | 31 | 29 | 60 | 4.1 |
| 5-9 | 7 | 5 | 12 | 1.5 | 27 | 28 | 55 | 3.8 |
| 10-14 | 11 | 4 | 15 | 1.8 | 39 | 14 | 53 | 3.6 |
| 15-19 | 10 | 3 | 13 | 1.6 | 25 | 13 | 38 | 2.6 |
| 20-24 | 88 | 9 | 97 | 12.0 | 156 | 21 | 177 | 12.2 |
| 25-29 | 161 | 11 | 172 | 21.3 | 256 | 15 | 271 | 18.6 |
| 30-34 | 159 | 4 | 163 | 20.1 | 230 | 15 | 245 | 16.4 |
| 35-39 | 145 | 3 | 148 | 18.3 | 213 | 8 | 221 | 15.2 |
| 40-44 | 92 | - | 92 | 11.4 | 162 | 9 | 171 | 11.7 |
| 45-49 | 45 | 1 | 46 | 5.7 | 85 | 6 | 91 | 6.2 |
| 50-54 | 9 | - | 9 | 1.1 | 30 | 5 | 35 | 2.4 |
| 55-59 | 7 | - | 7 | 0.9 | 13 | 2 | 15 | 1.0 |
| 60-64 | 2 | - | 2 | 0.2 | 3 | 1 | 4 | 0.3 |
| 65+ | 6 | 2 | 8 | 1.0 | 7 | 7 | 14 | 0.9 |
| TOTAL | 756 | 53 | 809 | 100.0 | 1,286 | 176 | 1,462 | 100.0 |
| | | | | | | | 2,271 | 100.0 |

Source: derived from Department of Statistics, 1978, Unpublished preliminary results provided by the Jordan Valley Authority, hand-tabulated from computer print-outs by the author. (March 1980, Amman).

TABLE 36 (b) JORDAN VALLEY, JORDANIAN POPULATION BY AGE, SEX AND SUB-DISTRICT, 1978

| District Age Group | Irbid | | | Balqa | | | Total Valley | |
|-----------------------|--------|--------|--------|-------|--------|--------|--------------|-------|
| | Male | Female | Total | % | Male | Female | Total | % |
| 0 | 956 | 895 | 1,851 | 4.3 | 713 | 700 | 1,413 | 4.6 |
| 1-4 | 2,412 | 3,281 | 6,693 | 15.6 | 2,447 | 2,353 | 4,800 | 15.5 |
| 5-9 | 3,978 | 3,641 | 7,619 | 17.7 | 2,829 | 2,601 | 5,430 | 17.6 |
| 10-14 | 3,439 | 3,180 | 6,619 | 15.4 | 2,336 | 2,088 | 4,422 | 14.3 |
| 15-10 | 2,278 | 2,213 | 4,491 | 10.5 | 1,485 | 1,496 | 2,981 | 9.6 |
| 20-24 | 1,447 | 1,432 | 2,879 | 6.7 | 991 | 1,009 | 2,000 | 6.5 |
| 25-29 | 880 | 918 | 1,798 | 4.2 | 742 | 839 | 1,581 | 5.1 |
| 30-34 | 875 | 1,143 | 2,018 | 4.7 | 735 | 812 | 1,547 | 5.0 |
| 35-39 | 916 | 1,042 | 1,958 | 4.6 | 749 | 787 | 1,536 | 5.0 |
| 40-44 | 911 | 888 | 1,799 | 4.2 | 759 | 660 | 1,419 | 4.6 |
| 45-49 | 723 | 625 | 1,348 | 3.1 | 549 | 413 | 962 | 3.1 |
| 50-54 | 554 | 520 | 1,074 | 2.5 | 398 | 339 | 737 | 2.4 |
| 55-59 | 384 | 310 | 694 | 1.6 | 298 | 207 | 505 | 1.5 |
| 60-64 | 411 | 331 | 742 | 1.7 | 321 | 241 | 562 | 1.8 |
| 65+ | 736 | 596 | 1,332 | 3.1 | 577 | 433 | 1,010 | 3.3 |
| TOTAL | 21,900 | 21,015 | 42,915 | 100.0 | 15,929 | 14,978 | 30,907 | 100.0 |
| | | | | | | | 73,822 | 100.0 |

Source: derived from Department of Statistics, 1978, unpublished preliminary results provided by the Jordan Valley Authority, hand tabulated from computer print-outs by the author. (March 1980, Amman)

TABLE 37 : EAST JORDAN VALLEY: EMPLOYED JORDANIAN POPULATION
BY SEX AND SUB-DISTRICT, 1978

| | Total Valley | Irbid | Deir Alla | Shuna |
|--------|--------------|-------|-----------|-------|
| Male | 13,080 | 7,349 | 2,765 | 2,946 |
| Female | 442 | 300 | 80 | 62 |
| Total | 13,522 | 7,649 | 2,865 | 3,008 |

Source: Department of Statistics, 1978, Preliminary, unpublished results provided by the Jordan Valley Authority. Amman, March 1980.

TABLE 38 : EAST JORDAN VALLEY: DISTRIBUTION OF EMPLOYED MALES
(OVER 15) BY SECTOR, 1973 AND 1978

| | 1973 ¹ | | 1978 ² | |
|---|-------------------|-------|-------------------|-------|
| | No. | % | No. | % |
| Agriculture | 10,282 | 76.3 | 9,784 | 63.1 |
| Electricity, Gas and Water | 37 | 0.3 | 526 | 3.4 |
| Construction | 123 | 0.9 | 442 | 2.9 |
| Wholesale and Retail | 440 | 3.3 | 514 | 3.4 |
| Transportation, Storage and Communication | 217 | 1.6 | 3,509 | 4.1 |
| Community, Social and Personal Services | 2,206 | 16.4 | 3,509 | 22.6 |
| Others | 169 | 1.2 | 91 | 0.6 |
| TOTAL | 13,475 | 100.0 | 15,497 | 100.0 |

Source: 1. Department of Statistics, 1973, 98 and 111, Tables 11A and 12.

2. derived from Department of Statistics, 1978.
Unpublished preliminary results provided by the JVA,
hand-tabulated by the author. (Amman 1980)

After Rhoda, 1980, 25, Table II.7A

TABLE 39 : EAST JORDAN VALLEY: ANNUAL LABOUR REQUIREMENT OF
MAIN CROPS 1975-2000 (Man-days per dunum)

| | 1975 | 2000 |
|------------------|------|------|
| Tomatoes | 17.5 | 15 |
| Eggplants | | |
| Pepper | | |
| Other Vegetables | 12.5 | 10 |
| Bananas | 30.0 | 25 |
| Citrus | 20.0 | 20 |
| Wheat | 2.0 | 1.5 |
| Maize | 4.0 | 2.0 |
| Fodder Crops | 7.0 | 10.0 |

Source: derived from Dar-al-Handasah NEDCO 1969, Main Plan Table 17

TABLE 40 : JORDAN VALLEY: NON-JORDANIAN POPULATION AGE/SEX DISTRIBUTION (NOVEMBER 1978) BY NATIONALITY

| Age Group | Egyptian | | | Pakistani | | | S. Korean | | | Indian | | |
|-----------|----------|--------|-------|-----------|--------|-------|-----------|--------|-------|--------|--------|-------|
| | Male | Female | Total | Male | Female | Total | Male | Female | Total | Male | Female | Total |
| 0 | 1 | - | 1 | 7 | 3 | 10 | - | - | - | 1 | - | 1 |
| 1-4 | 1 | 4 | 5 | 30 | 26 | 56 | - | - | - | - | - | - |
| 5-9 | 1 | 2 | 3 | 24 | 23 | 47 | - | - | - | - | - | - |
| 10-14 | 2 | 2 | 4 | 34 | 11 | 45 | - | - | - | 1 | - | 1 |
| 15-19 | 8 | 2 | 10 | 14 | 8 | 22 | - | - | - | 7 | 1 | 8 |
| 20-24 | 86 | 12 | 98 | 13 | 8 | 21 | 2 | - | 2 | 100 | - | 100 |
| 25-29 | 139 | 12 | 151 | 8 | 6 | 14 | 180 | - | 180 | 75 | - | 75 |
| 30-34 | 108 | 1 | 109 | 14 | 14 | 28 | 216 | - | 216 | 45 | - | 45 |
| 35-39 | 94 | - | 94 | 19 | 7 | 26 | 210 | - | 210 | 27 | - | 27 |
| 40-44 | 67 | 1 | 68 | 16 | 7 | 23 | 134 | - | 134 | 24 | - | 24 |
| 45-49 | 45 | - | 45 | 5 | 5 | 10 | 68 | - | 68 | 8 | - | 8 |
| 50-54 | 25 | - | 25 | 2 | 4 | 6 | 7 | - | 7 | - | - | - |
| 55-59 | 8 | - | 8 | 4 | 2 | 6 | 6 | - | 6 | - | - | - |
| 60-64 | 2 | - | 2 | 1 | 1 | 2 | - | - | - | - | - | - |
| 65+ | 4 | 1 | 5 | 3 | 5 | 8 | - | - | - | - | - | - |
| TOTAL | 591 | 37 | 628 | 194 | 130 | 324 | 851 | - | 851 | 288 | 1 | 289 |

Source: derived from Department of Statistics, 1978, hand tabulated from computer print-outs by the author.

TABLE 41 : EAST JORDAN VALLEY: DISTRIBUTION OF NON-JORDANIAN POPULATION BY SUB-DISTRICT, NOVEMBER 1978

| Sub-district | Egyptian | | Pakistani | | S. Korean | | Indian | | TOTAL | |
|--------------|----------|-------|-----------|-------|-----------|-------|--------|-------|-------|-------|
| | No. | % | No. | % | No. | % | No. | % | No. | % |
| Irbid | 199 | 31.7 | 7 | 2.2 | 370 | 43.5 | 152 | 52.6 | 728 | 34.8 |
| Balqa | 429 | 68.3 | 317 | 97.8 | 481 | 56.5 | 137 | 47.4 | 1,364 | 85.2 |
| TOTAL | 628 | 100.0 | 324 | 100.0 | 851 | 100.0 | 289 | 100.0 | 2,092 | 100.0 |

Source: derived from Department of Statistics, 1978, hand-tabulated from computer print-outs by the author.

sector of Cairo, financed by relatives and friends. Characteristically, migrants move within the Valley, frequently holding several jobs during their stay, often on a daily basis. There is only limited use of 'official' remittance channels, the majority making transfers of 'merchandise remittances' on their return home. Informal observation also suggests that secondary labour migrants will not use the work permit system since one of their chief advantages is mobility and availability at short notice. The work permit regulations would require the migrant to obtain a new permit for each job. Estimated administration and travel costs ranged from JD 50-75 which is soon covered by average migrant incomes of JD 50-55 per month.

These characteristics make it unlikely that Egyptian migrants will be encouraged to take up positions as sharecroppers. Under the sharecropping system as it operates in the East Jordan Valley, the sharecropper obtains a subsistence loan to be repaid with interest at the end of the cropping season. In return for supplying all the inputs (apart from labour), the owner sets the price for purchasing the produce and the farmer is prohibited from seeking alternative outlets on the open market. Revenues and costs are then divided, usually on a 1:2 ratio between farmer and landowner. Dajani¹⁴ suggests that few farmers manage to break even and thus continue in debt with no alternative but to continue to work the land at subsistence levels and to accept the terms dictated until they can repay the loan. The result is a system of exploitation of farmers by landowners who monopolize the supply and marketing functions of small farms.

3.3. Income and Employment Distribution

Table 42 shows an active Jordanian population of 13,252 in 1978 (over 15); this compares with 19,495 in 1973 (Table 43), of whom 15,734 were in the agricultural sector, forming some 82 per cent of the total labour force (Table 44).

An examination of income and employment distribution data may explain why Jordanians have not migrated to the Valley. Rhoda divides the Jordanian employed population into five categories:

(i) Jordanian Farm Labour.

As discussed above, the number of Jordanian farm labourers has declined to a level below 2,000 in

TABLE 42 : JORDAN VALLEY: JORDANIAN EMPLOYED POPULATION BY AGE, EMPLOYMENT STATUS AND SUBDISTRICT, 1978

| District Age Group | Irbid | | | Balqa | | | TOTAL Jordanians Employed |
|--------------------------|-----------|------------------------------|-----------|-----------|------------------------------|-----------|---------------------------------|
| | Employers | Workers on own account | Employees | Employers | Workers on own account | Employees | |
| 15-19 | 12 | 142 | 470 | 8 | 82 | 425 | 1190 |
| 20-24 | 28 | 325 | 835 | 13 | 182 | 590 | 3015 |
| 25-29 | 22 | 285 | 256 | 19 | 242 | 439 | 1270 |
| 30-34 | 16 | 349 | 498 | 14 | 302 | 394 | 1580 |
| 35-39 | 23 | 418 | 455 | 22 | 349 | 355 | 1625 |
| 40-44 | 34 | 430 | 433 | 14 | 372 | 347 | 1634 |
| 45-49 | 25 | 359 | 319 | 15 | 287 | 222 | 1229 |
| 50-54 | 26 | 273 | 231 | 16 | 193 | 155 | 894 |
| 55-59 | 14 | 202 | 136 | 13 | 162 | 90 | 619 |
| 60-64 | 14 | 224 | 120 | 9 | 139 | 102 | 614 |
| 65+ | 18 | 263 | 126 | 9 | 176 | 116 | 708 |
| TOTAL | 232 | 3,268 | 3,879 | 152 | 2,486 | 3,235 | 13,252 |

Source: derived from Department of Statistics, 1978, hand-tabulated from computer print-outs by the author

TABLE 43 : EAST JORDAN VALLEY: POPULATION AND LABOUR FORCE, 1973

| | Population | Percentage Distribution | Labour force participation rate | Labour force no. | Percentage Distribution |
|--------|------------|----------------------------|--|------------------------|----------------------------|
| North | 28,062 | 43.8 | 28.4 | 7,957 | 40.8 |
| Middle | 25,795 | 40.3 | 34.5 | 8,903 | 45.7 |
| South | 10,155 | 15.9 | 25.9 | 2,635 | 13.5 |
| TOTAL | 64,012 | 100.0 | 30.5 | 19,945 | 100.0 |

Source: derived from Department of Statistics, 1973, Various tables.

TABLE 44 : EAST JORDAN VALLEY: DISTRIBUTION OF EMPLOYMENT

| | North | Middle | South | Total EJY |
|--|-------|--------|-------|-----------|
| Agriculture | 72.7 | 84.4 | 82.8 | 81.9 |
| Manufacturing | 0.9 | 1.6 | 1.6 | 1.4 |
| Electricity, Gas and Water Supply | 0.1 | 0.2 | 0.7 | 0.2 |
| Construction | 1.0 | 0.6 | 0.7 | 0.7 |
| Trade, Restaurants and Hotels | 3.3 | 2.2 | 2.5 | 2.4 |
| Transport, Storage and Communications | 1.9 | 1.0 | 1.0 | 1.2 |
| Community, Social and Personal Services | 20.0 | 9.3 | 10.6 | 12.2 |
| TOTAL | 100.0 | 100.0 | 100.0 | 100.0 |

Source: derived from Department of Statistics, 1973.

TABLE 45 : EAST JORDAN VALLEY: 1979 ESTIMATED INCOME LEVELS (JD)

| | Jordanian Farm Workers | Sharecroppers | Land Owning Farmers | Public and Private Employees | Own account Non-farm Labour |
|-------------------------------------|------------------------------|---------------|---------------------------|------------------------------------|-----------------------------------|
| Number of workers | 2,500 | 2,700 | 2,300 | 4,800 | 800 |
| Income Range | 800-1,200 | 500-3,000 | 900+ | 900-3,000 | 1,200 |
| Median Income | 1,100 | 1,200 | 2,400 | 960 | 3,000 |
| Median Income p.c. (5.3 dependents) | 175 | 190 | 350 | 160 | 475 |
| Total Population | 15,750 | 17,010 | 14,490 | 30,240 | 5,040 |
| % less than JD 175 p.a. | 50 | 40 | 25 | 65 | 10 |
| Number with less than JD 175 p.a. | 7,875 | 6,804 | 3,623 | 19,650 | 504 |
| % less than JD 125 p.a. | 15 | 25 | 15 | 30 | - |
| Number with less than JD 125 p.a. | 2,363 | 4,253 | 2,174 | 9,072 | - |

Source: derived from Rhoda, 1980. 3b, Table 11-c

1980, despite increasing wage rates. Permanent Jordanian agricultural labour earns between JD 80-100 per month with an annual income of JD 1-1,200; comparable wages for non-Jordanians are JD 50-55 per month. With an average of 5.3 dependents, the former represents an annual per capita income of JD 160-190. This should be seen in the context of imputed poverty income levels of JD 125-175 per capita (Table 45). From this it appears that the majority of Jordanian farm labourers are relatively lowly paid and may well be living close to the poverty level, despite their wage differential over non-Jordanian labour.

(ii) Sharecroppers.

Rhoda estimates the number of sharecroppers at 2,680 in 1978. Establishing an average for this sector is both difficult and misleading because of the range of incomes obtainable depending on the landlord/tenant relationship, holding size, location and agronomic practices adopted. Nevertheless, fieldwork conducted in March 1980 in the Deir Alla area established the pattern of gross returns shown in Table 46. Data on variable costs are taken from Steitieh's survey (Table 47).

The majority of sharecroppers do not have plastic covers, thus net returns per dunum probably average JD 50-200 per annum which, on an average thirty dunum holding, renders an annual income of JD 1,500-6,000. On the 50 per cent sharecropping basis, the farmer's income would be JD 750-3,000 which, with 5.3 dependents, provides an average per capita income of JD 120-476 per annum. For those with plastic covers, per capita income could in theory reach JD 3,000, but areas of plastic are seldom over 10 dunum on a single holding.

TABLE 46 : EAST JORDAN VALLEY: GROSS AND NET INCOMES UNDER
ALTERNATIVE AGRONOMIC PRACTICES 1980 (JD/dunum)

| Farming Technology | Gross Returns | Variable Costs | Net Returns |
|---|---------------|----------------|-------------|
| 1. 'Dawaleeb', Open Furrow Irrigation | 75-150 | 25-50 | 55-100 |
| 2. Plastic Tunnels and Surface Irrigation | 200-500 | 180 | 50-320 |
| 3. Plastic Tunnels and Drip Irrigation | 300-650 | 200 | 100-450 |
| 4. Plastic Houses and Surface Irrigation | 1,000-1,600 | 525 | 475-1,075 |
| 5. Plastic Houses and Drip Irrigation | 1,100-2,200 | 650 | 450-1,550 |

Source: gross returns from fieldwork survey in the East Jordan Valley, March 1980. Variable costs come from Table 5.17 and from Dar-al-Handasah/NEDCO, 1969, Appendix G.

TABLE 47 : EAST JORDAN VALLEY, GROSS AND NET RETURNS FROM PRODUCING CUCUMBER UNDER DIFFERENT FARMING SYSTEMS 1978-1979

| Farming System | Average Wholesale Price JD/ton | Yield ton/d | Gross Returns JD/d | Production Costs JD/d | Marketing Costs JD/d | Total Variable Costs JD/d | Net Returns JD/d | Initial Capital Investment JD/d |
|---|--------------------------------|-------------|--------------------|-----------------------|----------------------|---------------------------|------------------|---------------------------------|
| Plastic houses with drip | 256.0 | 8.5 | 2176.0 | 337.3 | 313.7 | 651.0 | 1525.0 | 1998.0 |
| Plastic houses with surface irrigation | 266.5 | 6.0 | 1599.0 | 296.5 | 225.8 | 522.3 | 1076.7 | 1718.0 |
| Plastic tunnels with drip | 283.0 | 2.2 | 622.6 | 111.4 | 85.3 | 196.7 | 425.9 | 366.7 |
| Plastic tunnels with surface irrigation | 283.0 | 1.7 | 481.0 | 111.7 | 65.9 | 177.6 | 303.4 | 86.7 |

Source: derived from Table 17 in Steltieh and Musa, 1980

Note: 1. See Steltieh and Abbas, 1979

Rhoda suggests the median sharecropper family has an annual income of JD 190 per capita, but that some 40 per cent have less than JD 175 and 20 per cent less than JD 125 since some 43 per cent of holdings are under 20 dunum (Table 18). Under traditional practices, a 10 dunum holding would yield a per capita income of less than JD 75.

Without the capital backing for investment in plastic covers (Table 47), this analysis shows that sharecropping will not provide the attractive income which was the main inducement offered by the Jordan Valley Commission to encourage movement.

(iii) Landowning Farmers.

Income for landowning farmers can be calculated on the same basis as that for sharecroppers. However, average size of holdings tends to be larger (41 dunum) and farmers do not share their income. Average net income ranges from JD 2,000-8,000, with a median per capita income of JD 350 per annum.

(iv) Public Servants and Private Sector Non-Agricultural Employees.

The average wage for public employees equals JD 85 per month but Rhoda estimates that 65 per cent have per capita incomes below JD 175.

(v) Own Account Non-Agricultural Workers.

There are a relatively small number (800) of own account non-agricultural sector workers, mainly retailers with estimated income per capita of JD 475.

The author's own work relating to agricultural sector incomes and Rhoda's preliminary analysis of non-agricultural sector incomes suggest that some 42 per cent of the East Jordan Valley population have per capita incomes under JD 175. On this basis, the JVA can hardly expect to attract population when the average per capita income for Jordan is JD 250-300.

3.4. A Reassessment of Secondary Labour Migration

Table 48 shows an active non-Jordanian population of 1,788 in 1978 (over 15) with a spatial distribution of 37.9 per cent in the North and 62.1 per cent in the South. Some 96.9 per cent (1,733) are employees, almost entirely in the agricultural sector. It was argued above that, if the presence of secondary labour migrants was merely indicative of short term labour shortages, then the in-migrants are playing a useful role in maintaining the development momentum, albeit at a slower pace. In the East Jordan Valley, however, income and employment data imply that secondary labour migrants are being employed in preference to Jordanians primarily because of their price advantage.

Fieldwork has revealed that secondary migrants work within two systems:

- (i) 'Permanent' agricultural labour.
'Permanent' refers to more than three months employment with a single employer.
- (ii) 'Temporary' agricultural labour
'Temporary' workers may be hired on either an hourly or a daily basis.

'Permanent' labour can earn on average JD 50-55 per month while 'temporary' wage rates range from JD 0.25-0.35 per hour and JD 1-1.5 per day. Temporary workers may have several days without work, depending on the season and availability of labour. During periods of temporary 'unemployment', they will tend to circulate within the Valley in search of further employment opportunities. Earnings can reach JD 35-40 per month for 'temporary labour'.

These wage rates suggest extreme poverty when compared to the Jordanian agricultural labour demanding JD 80-100 per month but, in comparison with wages for agricultural labour in Egypt, earnings by migrants in the East Jordan Valley are relatively high. In Egypt, average annual per capita income has been estimated at the equivalent of JD 75; a replacement migrant with 5.3 dependents in Egypt earns, on the basis of the analysis presented above, an average annual per capita income of JD 95-100, which is relatively high in Egyptian terms.

Secondary labour migrants are able to keep their living costs to

TABLE 48 : JORDAN VALLEY: NON-JORDANIAN POPULATION BY AGE, EMPLOYMENT STATUS AND SUB-DISTRICT

| District | Irbid | | | | Balqa | | | | Total Employed Non-J |
|----------|-----------------|-----------------------------|----------------|----------------------|-----------------|-----------------------------|----------------|----------------------|----------------------|
| | Non-J Employers | Non-J Worker on own account | Non-J Employee | Total Non-J Employed | Non-J Employers | Non-J Worker on own account | Non-J Employee | Total Non-J Employed | |
| 15-19 | - | - | 9 | 9 | - | 3 | 20 | 23 | 32 |
| 20-24 | - | 3 | 83 | 86 | 1 | 12 | 139 | 152 | 238 |
| 25-29 | - | 2 | 156 | 158 | - | 3 | 241 | 244 | 402 |
| 30-34 | - | 6 | 140 | 146 | 1 | 2 | 205 | 208 | 354 |
| 35-39 | - | 6 | 127 | 133 | - | 5 | 201 | 206 | 339 |
| 40-44 | - | 1 | 85 | 86 | - | 1 | 150 | 151 | 237 |
| 45-49 | - | - | 40 | 40 | - | 4 | 75 | 79 | 119 |
| 50-54 | - | - | 8 | 8 | - | 2 | 28 | 30 | 38 |
| 55-59 | - | - | 7 | 7 | - | - | 11 | 11 | 18 |
| 60-64 | - | 1 | 1 | 2 | - | 1 | 2 | 3 | 5 |
| 65+ | - | 1 | 2 | 3 | - | - | 3 | 3 | 6 |
| TOTAL | - | 20 | 656 | 678 | 2 | 33 | 1,015 | 1,110 | 1,788 |

Source: derived from Department of Statistics, 1978; Unpublished preliminary results provided by the JVA.

a minimum; the majority live in makeshift tents, derelict mud huts, plastic greenhouses and in the open fields. Food is often taken directly from the fields or may be given as partial payment by the employer. Some employers provide shelter for their 'permanent' workers, engaged predominantly in unskilled manual labouring.

Fieldwork has also revealed the existence of 'labour pools' containing up to twenty labourers available for work on a daily basis. Employers wishing to hire a certain number of labourers for work will go to the pool and collect the workers after negotiating a wage for the day's work. In some cases, a relationship will be established, a 'temporary' worker hired on a daily basis for several months thus becoming a 'permanent' labourer and leaving the pool. The author has identified at least three such labour pools in the Dair Alla area. These pools appear to be the starting point for many newly-arrived replacement migrants. Others will go straight into employment with a farmer on the basis of previous contact through relatives' recommendations.

Both the availability and price advantage act in favour of Egyptian secondary labour migrants over Jordanian labour. Replacement migrants are thus being hired not to replace Jordanians but to displace a more expensive labour force.

The availability of relatively cheap labour has encouraged the proliferation of labour-intensive technology adoption through plasticulture where labour costs are 40-54 per cent of total costs. Table 48 shows the input cost of labour in relation to material inputs for production of tomatoes and cucumbers under plastic covers. Labour costs are shown to range from 38.7 per cent to 54.1 per cent of total input costs, of which 37.5 per cent to 64.3 per cent is absorbed in harvesting. Where labour costs are such a large proportion of inputs it is logical for the farmer to minimize these costs by seeking the cheapest alternative. In producing cucumbers under plastic houses with drip irrigation, the labour costs in 1978/1979 were JD 150 per dunum; if the farmer had hired Jordanian labour this proportion of the cost would have risen to JD 250-300. With unskilled labouring, the marginal product of Jordanian labour is unlikely to be any greater than Egyptian secondary labour migrants.

Steitieh's survey shows that in 1979/80 97 per cent of labour working with plastic covers was non-Jordanian. The proportion of non-Jordanian labour (1978/9) ranges from 79.3 per cent in the North to 90 per cent in the South and 95.3 per cent in the Middle Region. In the

TABLE 49 : PRODUCTION COSTS OF CUCUMBER AND TOMATO UNDER PLASTIC COVERS AND DRIP IRRIGATION SYSTEMS IN THE EAST JORDAN VALLEY, 1978-1979 (JD/d)

| COST ITEMS | Cucumber | | | | Tomato Drip |
|------------------------------------|----------|---------|---------|---------|----------------|
| | Plastic | Houses | Plastic | Tunnels | |
| | Drip | Surface | Drip | Surface | |
| 1. Material Inputs | 187.7 | 156.5 | 68.3 | 68.5 | 37.8 |
| 2. Labour Inputs | | | | | |
| a) Sowing, replanting | 4.5 | 6.0 | 1.8 | 2.0 | 4.3 |
| b) Fertiliser application | 3.0 | 10.0 | 2.6 | 3.5 | 2.5 |
| c) Irrigation | 0.0 | 13.0 | 0.0 | 5.4 | 0.0 |
| d) Spraying and fumigation | 28.3 | 22.0 | 4.5 | 3.0 | 2.0 |
| e) Pruning | 27.3 | 35.6 | 0.0 | 0.0 | 0.0 |
| f) Weeding and hoeing | 2.5 | 14.2 | 1.8 | 4.0 | 3.0 |
| g) Ventilation | 0.0 | 0.0 | 5.0 | 3.9 | 0.0 |
| h) Installing drippers and mulch | 4.5 | 0.0 | 4.1 | 0.0 | 4.1 |
| i) Tunnel installation and removal | 0.0 | 0.0 | 4.2 | 5.2 | 0.0 |
| j) Plastic removal in houses | 5.3 | 6.4 | 0.0 | 0.0 | 0.0 |
| k) Harvesting | 74.2 | 52.8 | 19.1 | 16.2 | 28.7 |
| TOTAL LABOUR INPUTS | 149.6 | 138.0 | 43.1 | 43.2 | 44.6 |
| TOTAL MATERIAL AND LABOUR INPUTS | 337.3 | 296.5 | 111.4 | 111.7 | 82.4 |

Source: derived from Steitieh and Musa, 1980, 37, Table 15.



whole Jordan Valley, only 16 Jordanians were found as permanent labour under plastic covers in comparison with 315 non-Jordanians. If there had been an inflow of Jordanians to the East Jordan Valley as the JVA and other analysts believe, then why have Jordanians not been employed in the fastest-growing and most profitable sector? This is further evidence to support the view that the inflow revealed by the 1978 and 1979 censuses is misleading and it also supports the inference of active displacement by Egyptian labour.

Steitieh believes that, given a continuation of current market trends in the regional demand for vegetable production, then plasticulture can only expand dramatically in the East Jordan Valley. This can only be achieved by growth in the number of secondary labour migrants. Plastic covers were first introduced in 1975 in the Deir Alla area and have since expanded dramatically, increasing by 65 per cent over the 1977/1978 to 1978/1979 season. These new agricultural practices have the advantage over traditional practices of greater productivity per worker. Average labour inputs in 'dawaleeb' surface irrigation have been estimated at 130 man-hours per dunum; at current rates for Jordanian labour, costs would be approximately JD 64 per dunum. This is far greater than the average cost per dunum of growing vegetables under plastic covers using secondary labour (Table 48).

Steitieh's survey also shows that plastic houses have expanded most rapidly, increasing 160 per cent in area (1977/78 to 1978/79) compared with a 58 per cent increase in plastic tunnels over the same period (Table 28). This has profound implications for the course of development in the East Jordan Valley since this is a highly capital-intensive development (Table 47). The initial capital investment per dunum in plastic houses with drip irrigation amounts to JD 2,000, to which must be added relatively high running and renewal costs (the drip system has to be renewed annually and plastic covers at least once in four years). It follows that only those farmers with sufficient capital backing (usually land) will be able to raise the necessary credit. It can thus be predicted that larger areas of land will be cultivated under both capital- and labour-intensive systems, increasingly concentrated in the hands of a few Jordanian landowners and operated by technically proficient (often Palestinian) farm managers. Higher and more certain profits make sharecropping less attractive to landowners. One can thus envisage a process leading to the progressive marginalization of more traditional

farmers and sharecroppers.

In conclusion, discussion returns to the question posed earlier : why has there not been an in-migration of Jordanians to the East Jordan Valley? This can be answered in terms of the evolution and timing of the international labour migration discussed above. The Jordan Valley Development Plan was launched at the same time as increased employment opportunities for Jordanians of all skill levels to work abroad became available. The incentives being offered in terms of employment, income, housing and social service provision in the East Jordan Valley were compared, by potential migrants, not with alternatives within Jordan but with the attraction of relatively high incomes to be earned in the Arabian Peninsula. Added weight in favour of the latter option came from the limited experience that most of the rural population had had with irrigated agriculture. In regional terms, therefore, the East Jordan Valley offered a harsh, high-risk environment with relatively low and variable income levels. The opportunities available from international labour migration can therefore be seen to have undermined the aims and evolution of the Jordan Valley Project. Those Jordanians who remained demanded higher incomes, reducing their market potential and increasing the opportunities for replacement migration. This process has been self-reinforcing and encouraged further labour- and capital-intensive development which increasingly erode the original plan intentions. The availability of a cheap, mobile, non-Jordanian labour force (the secondary labour force) willing to accept wages well below the poverty line in Jordan and to work in poor environmental and social conditions is both reducing opportunities for Jordanian agricultural labour by keeping wages down and encouraging the growth of labour and capital intensive development.

In conclusion, the author argues for a reassessment of secondary labour migration and the recognition of its more pervasive impact. In the short run it is leading to increased production but concomitantly it means the abandonment of the aims of integrated rural development based on small family farms.

The reduction in opportunities for Jordanian nationals to work in the East Jordan Valley is of particular significance since the latter is the only rural area where employment opportunities have increased substantially. Furthermore, it reinforces the pattern of domestic labour abandoning the rural sector.

In Part One the author intimated that recent data suggest a growing tide of return migration. This could have serious repercussions for the national economy, given a return to high levels of unemployment, paralleled by a fall in the level of remittances.

A continued high level of 'replacement' and secondary labour combined with burgeoning unemployment amongst nationals could provide the catalyst for serious social and political conflict unless the administration plans now for return migration. It is almost inevitable that such plans will have to restrict the entry and employment of non-Jordanians and perhaps even the institution of a programme of forced repatriation to safeguard employment opportunities for the national workforce. Yet this will only be possible if the Jordanians will accept a significant reduction in remuneration levels. To believe that these changes can be instituted without considerable social and political unrest would be dangerously naive.

NOTES

1. Jordan Valley Commission, 1975, C4
2. See Rhoda, R., 1980, 38-62 for a discussion of service provision in the East Jordan Valley 1973-1980
3. Mazur, 1979, 182
4. Dr. Issam Hussein Ali, Policy Analysis Unit, Jordan Valley Authority. Personal communication, March 1980. Amman.
5. Sutcliffe, 1971. Also Sahawneh, 1970.
6. Department of Statistics, 1978,
7. Department of Statistics, 1979a
8. Department of Statistics, 1973, 17
9. Rhoda, 1980, 9
10. Steitieh, and Musa, 1980, 12
11. Dr. Akran Steitieh. Personal communication, September 1980.
12. Rhoda, 1980, 12
13. Dar-al-Handasah/NEDCO, 1969
14. Dajani, 1979, 14-19

BIBLIOGRAPHY

- ARAB ECONOMIST (1978) "Labour migration hampers economic development", X, 198
- ARESVIK, A. (1976) Agricultural Development of Jordan, New York: Praeger
- ASFOUR, B.J. and SMADI, M.A. (1978) The Economy of Jordan: a Sectoral Review, 1977, Amman: Royal Scientific Society
- ASFOUR, B.J. and SMADI, M.A. (1979) The Economy of Jordan in 1978 : a Review, Amman: Royal Scientific Society
- AZAR, W.Y. (1974) The Population Position of Jordan, Beirut: UNECWA, First Regional Population Conference
- BARHOUM, M. (1976) East Jordan Valley Villages versus Social Institutions, Ford Foundation
- BARKA and HARZA ENGINEERING CO. LTD. (1955) Yarmouk-Jordan Valley Master Plan, Volume 1, Chicago
- BIRKS, J.S. and SINCLAIR, C.A. (1978a) Country Case Study : the Hashemite Kingdom of Jordan, University of Durham : International Migration Project
- BIRKS, J.S. and SINCLAIR, C.A. (1978b) A Summary of Provisional Findings : Empirical Patterns, Past Trends and Future Developments, University of Durham : International Migration Project.
- BIRKS, J.S. and SINCLAIR, C.A. (1980a) Arab Manpower : the Crisis of Development, London : Croom Helm
- BIRKS, J.S. and SINCLAIR, C.A. (1980b) International Migration and Development in the Arab Region, Geneva : ILO
- BIRKS, J.S. and SINCLAIR, C.A. (1980c) The Socio-Economic Determinants of Intra-Regional Migration (Appendix A), Paper presented to the ECWA Conference on International Migration in the Arab World, 11-16 May 1981, Nicosia, Cyprus
- BIRKS, J.S. and SINCLAIR, C.A. (1981) Socio-Economic Determinants of Intra Regional Migration, University of Durham : Department of Economics, unpublished manuscript
- BÖHNING, W.R. (1978) Elements of a theory of International Migration and Compensation, World Employment Programme, Migration for Employment Project, Working Paper No. 34, Geneva : ILO
- CENTRAL BANK OF JORDAN (1977) Monthly Statistical Bulletin 13(9), September, Amman
- CENTRAL BANK OF JORDAN (1980a) Monthly Statistical Bulletin 16(3), March, Amman
- CENTRAL BANK OF JORDAN (1980b) Monthly Statistical Bulletin 16(5), May, Amman
- CENTRAL BANK OF JORDAN (1980c) Monthly Statistical Bulletin 16(12), December, Amman
- CENTRAL STATISTICAL OFFICE (Kuwait) (1980) Annual Statistical Abstract 1980, Volume 17, Kuwait
- CLARKE, J. (1977) Jordan : a Labour Receiver - a Labour Supplier, Washington, D.C. : USAID

- DAJANI, J.S. (1979) A Baseline Socio-Economic Study of the Southern Ghors and Wadi Araba, Amman: USAID
- DAJANI, J.S. and MURDOCK, M.S. (1978) Assessing Basic Human Needs in Rural Jordan, Amman: USAID
- DAR-AL-HANDASAH/HARZA (1977) Jordan Valley Development Plan Stage II : Feasibility Report, London
- DAR-AL-HANDASAH/HARZA (1978) Jordan Valley Irrigation Project Stage II : Feasibility Study, London
- DAR-AL-HANDASAH/NEDCO (1969) The Jordan Valley Project: Agro- and Socio-Economic Study, Final Report, Beirut
- DEPARTMENT OF STATISTICS (1961) East Jordan Valley: a Social and Economic Survey, Amman
- DEPARTMENT OF STATISTICS (1964) Census of Population and Housing, November 1961, Amman
- DEPARTMENT OF STATISTICS (1973) Social and Economic Survey of the East Jordan Valley, 1973, Amman
- DEPARTMENT OF STATISTICS (1975) Census of Industrial Establishments, 1975, Amman
- DEPARTMENT OF STATISTICS (1976a) The Multi-Purpose Household Survey (Jordanians Abroad), January-April 1975, Amman
- DEPARTMENT OF STATISTICS (1976b) Results of the Agricultural Census in the Ghors, 1975, Amman
- DEPARTMENT OF STATISTICS (1976c) Statistical Yearbook 1975, Amman
- DEPARTMENT OF STATISTICS (1977-80) The Agricultural Sample Survey of the Ghors, 1976-79, Amman, annually.
- DEPARTMENT OF STATISTICS (1977) General Results of the Agricultural Census 1975, Amman
- DEPARTMENT OF STATISTICS (1978) Jordan Valley Pre-Census Test, November 1978; unpublished preliminary results provided by the Jordan Valley Authority, Amman, March 1980
- DEPARTMENT OF STATISTICS (1979a) National Population Census 1979; unpublished preliminary results provided by the Jordan Valley Authority, Amman, March 1980
- DEPARTMENT OF STATISTICS (1979b) Statistical Yearbook 1978, No. 29, Amman
- DEPARTMENT OF STATISTICS (1980a) Agricultural Census 1978, Amman; unpublished preliminary results
- DEPARTMENT OF STATISTICS (1980b) Census of Population and Housing, November 1979 : Preliminary Results, Amman
- DEPARTMENT OF STATISTICS (1980c) Sample Survey in the Ghors, 1980, Amman
- ECEVIT, Z.H. (1979) International Labour Migration in the Middle East and North Africa - Trends, Effects and Policies, paper presented to the Rockefeller Foundation Conference on International Migration, Bellagio, Italy, June.
- FINANCIAL TIMES (1980) "Jordan" survey, June 18

- FIRKY, M. (1979) The Maqarin Dam and the East Jordan Valley, Amman : USAID
- GRAHAM-BROWN, S. (1980a) "Labour" in Middle East Economic Digest Special Report : Jordan, London
- GRAHAM-BROWN, S. (1980b) "Maqarin Dam offers medium term answers", MEED 24(4), January, 25
- GUNN RURAL MANAGEMENT LTD (1978) Livestock Project, Kuwait
- HARRIS, W.W. (1978) Refugees and Settlers : Geographical Implications of the Arab-Israeli Conflict, 1967-78, University of Durham, unpublished Ph.D. thesis
- HAZLETON, J.E. (1974) The Impact of the East Ghor Land Project on Land Consolidation, Distribution and Tenure, Amman, Royal Scientific Society
- HAZLETON, J.E. (1980) Agriculture in the EJY, 1973-1980, Amman, USAID, unpublished draft report
- INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT (1961) The Economic Development of Jordan, Baltimore : Johns Press
- INTERNATIONAL HERALD TRIBUNE (1979) Jordan, special issue, December 13
- ISSI, M.B. (1975) Socio-Economic Aspects of the Wadi Dhuleil Area of Jordan, Amman : Royal Scientific Society
- JORDAN VALLEY COMMISSION (1972) Rehabilitation and Development Plan of the Jordan Valley (East Bank) 1973-75, Amman
- JORDAN VALLEY COMMISSION (1975) Jordan Valley Development Plan, 1975-1982, Amman
- KELLER, J. (1977) Water Management Technology : Sprinkler Irrigation (Jordan) Training Program, Utah State University / USAID
- KIRMAN, F.X. (1980) The Impact of Labour Migration on the Jordanian Economy, unpublished manuscript
- HABOGUNJE, A.L. (1970) "Systems approach to a theory of rural-urban migration", Geographical Analysis 2, 1-18
- MAZUR, M.P. (1979) Economic Growth and Development in Jordan, London : Croom Helm
- McCLELLAND, D.H. (1979) Worker Migration and Worker Remittances - Jordan, Amman, USAID
- MEED (Middle East Economic Digest) (1976) 20(40) October 1
- MEED (1977) 21(22) June 3
- MEED (1979a) 23(1) January 5
- MEED (1979b) 23(3) January 19
- MEED (1979c) 23(28) July 13
- MEED (1979d) 23(37) September 14
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- MEED (1980b) 24(8) February 22
- MEED (1980c) 24(28) July 11

- MEED (1980d) 24(36) September 5
- MEED (1981a) 25(8) February 20
- MEED (1981b) 25(11) March 13
- MEED (1980) Special Report : Jordan, London, June
- MINISTRY OF EDUCATION (1978) Educational Statistical Yearbook 1978, Amman
- NATIONAL PLANNING COUNCIL (1976a) Labour Force in Jordan, paper presented to the Jordan Development Conference, 31 May - 4 June 1976, Amman
- NATIONAL PLANNING COUNCIL (1976b) Five Year Plan 1976-1980, Amman
- PENNISI, G. (1980) Development, Manpower and Migration in the Red Sea Region : the Case for Co-operation, Rome : Istituto Affari Internazionale, unpublished preliminary manuscript
- PITIE, J. (1971) Exode Rural et Migrations Interieures en France : l'Exemple de la Vienne et du Poitou-Charente, Poitiers, Editions Norois
- RHODA, R. (1980) Population Growth and the Provision of Public and Private Services, Washington D.C. : USAID, unpublished draft manuscript
- SAHAWNEH, F. (1970) Irrigation and Irrigated Agriculture in Jordan : an Economic Geographic Appraisal, Michigan State University, Ph.D. thesis
- SAKET, B. (1978) Labour Migration Abroad, opening speech to the Study Group on Worker Migration Abroad, held at the Royal Scientific Society, Amman, December
- SAKET, B., ASFOUR, B.J. and ASSAF, G. (1980) The Economy of Jordan over the 70s and 1979 : a Bird's-Eye View, Amman : Royal Scientific Society, quoted in MEED 24(34), August 22, 4-5
- SALES, M.E. (1978) Country Case Study : Syrian Arab Republic, University of Durham : International Migration Project
- SALT, A. and KEELEY, W. (1976) Manpower Developments in the Hashemite Kingdom of Jordan, with special reference to the East Jordan Valley, Washington D.C. : U.S. Department of Labor
- SECCOMBE, I.J. (1980) Jordanian Labour Migration : the Impact on Domestic Development, University of Durham, unpublished M.A. thesis.
- SHARAB, H. (1975) Agro-economic Aspects of Tenancy in the East Jordan Valley, Amman : Royal Scientific Society
- SINCLAIR, C.A. (1980) Unpublished manuscript
- STEITIEH, A.M., HABBAB, S. and ABBAS, M.F. (1978a) Area and Estimated Production of Vegetables Grown under Plastic Tunnels and Houses in the Jordan Valley, November 1977 - January 1978, Amman : University of Jordan, Faculty of Agriculture
- STEITIEH, A.M., ISSI, M.B. and BEQAEEN, A. (1978b) Population, Employment and Economic Development in Jordan, FAO/UNFPA P02 Project, Amman : University of Jordan, Faculty of Agriculture
- STEITIEH, A.M. and ABBAS, M.F. (1979) A Preliminary Economic Analysis of Returns from Producing Cucumber and Tomato under Plastic Covers and Drip Irrigation Systems, Amman
- STEITIEH, A.M. and MUSA, A.H. (1980) Vegetables Grown under Plastic Covers and Drip Irrigation in the East Jordan Valley, Amman : University of Jordan

2

SUTCLIFFE, C.R. (1971) Change in the Jordan Valley : the Impact and Implications of the East Ghor Canal Project, 1961-1966, Princeton University, New Jersey, Ph.D. thesis

UNFPA (1979) Jordan : Report of a Mission on Needs Assessment for Population Assistance, New York : United Nations

USAID/UNIVERSITY OF JORDAN (1980) Agro-cultural Sector Assessment, Amman, unpublished manuscript.



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